

CE

RAINBOW WURLITZER TOWER

**CD2 - CDM12
F91 / I84**

FIELD SERVICE MANUAL

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Warning

Although the beam emitted by the laser diodes is nearly invisible, it may cause severe damage to the human eye. Use an infrared indicator to check the laser beam.



Caution

The CD mechanism and many ICs are extremely susceptible to electrostatic discharges. The photo diodes and the laser diode are more sensitive to discharges than MOS ICs. Careless handling may immediately destroy components or can drastically reduce life expectancy of these components so that it will lead to failure after several weeks or even months of use.

Before you touch the Player, discharge your hands and tools by touching a grounded metal part of the jukebox, such as the amplifier or the mechanism chassis. Make sure that you are connected via a wrist wrap with resistance to the same potential as the chassis of the jukebox. Keep parts and tools at the same potential.

If you remove the player in case of repair or for transport, short the harness with a short circuit plug.

When repairing, observe all valid safety rules. Do not change the original condition of the jukebox. Use original spare parts only.

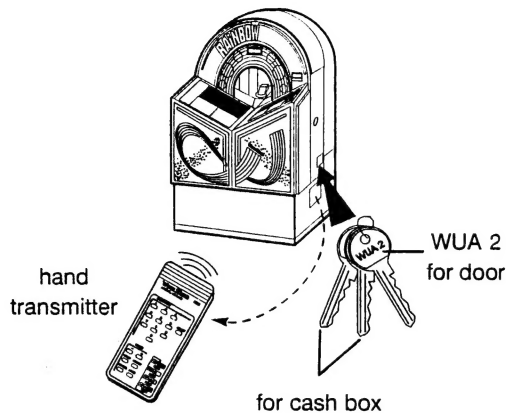


This manual belongs to machines equipped with program versions 4.08 (or higher).

Subject to alterations.

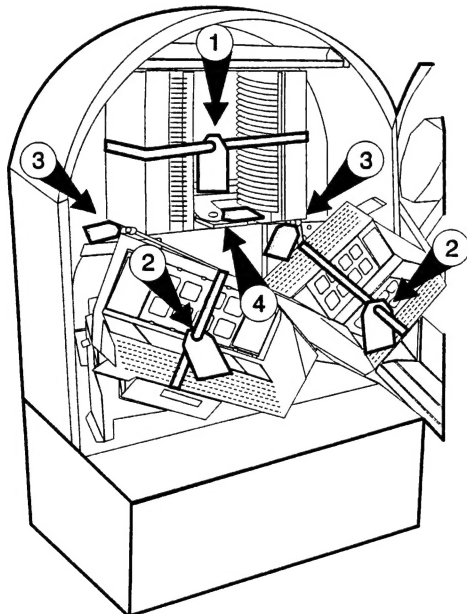
1. First installation

1.1. Unlocking



The key is stored in the coin return cup in the RH cabinet wall. The key WUA 2 unlocks the cabinet by turning the key clockwise. The lock is spring loaded, press slightly against the door, this allows to turn the key easily. The two other keys with 5 digit number codes unlock the cash box at the bottom of the RH cabinet wall. Inside of this box the hand transmitter is located if an infrared remote control had been installed.

1.2. Removal of shipping guards



1. Remove elastic band from the magazine cabinet.
2. Remove elastic band from the motor page systems.
3. Loosen both wing nuts on RH and LH underside of the magazine cabinet until fully extended.
4. Remove CD lens cover.

Remove shipping guard of bill validator if installed (is also marked with an indication plate).



IMPORTANT

Save the removed shipping guards. You may need them should you decide to move your machine to another location.

1.3. Verification of power voltage

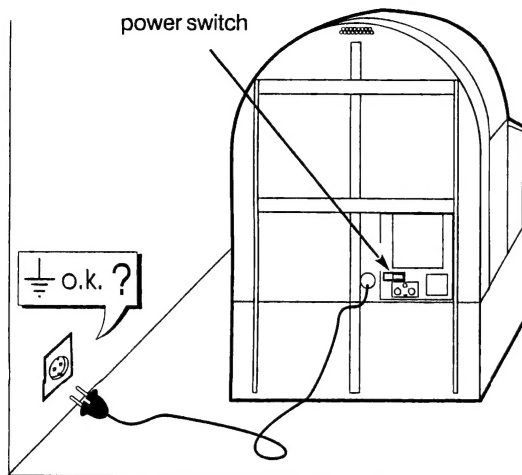


IMPORTANT

Make sure that power outlet is grounded properly.

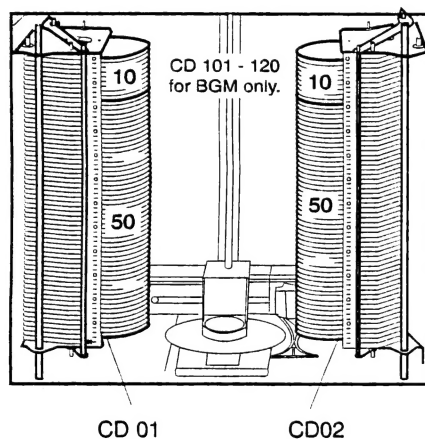
The jukebox can be delivered with two different amplifiers F91 and I84. You can check and modify the power setting on the power transformer of both amplifiers. It is described in the according chapter 'amplifier F91' and 'amplifier I84'.

1.4. Power on



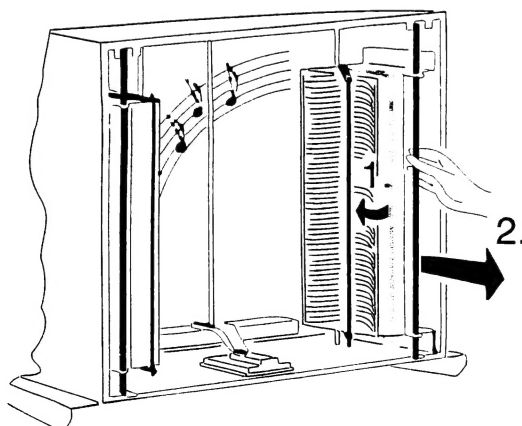
Insert the power plug. Set the power switch on the rear side of the jukebox to on. The illumination will light. The selection sledge starts an initialisation run and the counting of the disc compartments can be watched in the display. If all compartments are recognized the display shows "6 1 6 1" for short time. After all the sledge stops in its home position. The digital display shows the most played track. If the box is brandnew and the selection memory empty the display shows "0 0 0 0".

1.5. Position of CD's in magazines

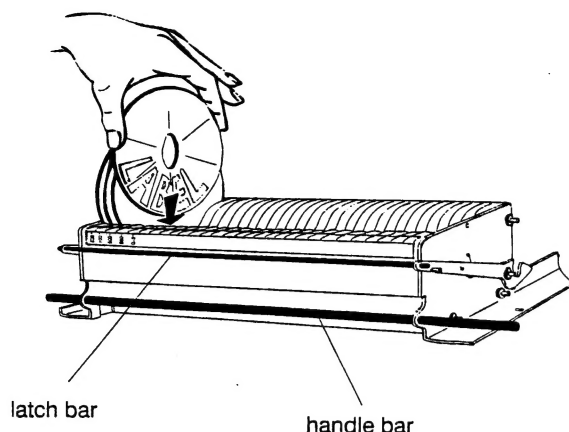


Up to 120 CDs can be inserted in total. The left magazine contains all CD's with odd compartment numbers (01, 03, 05 ...), the right one contains all even numbers (02, 04, 06 ...). But only 100 CDs can be selected in normal operation. (CD-no. 01 to CD no. (1)00). The CD's number 101 - 120 you can use only for Back Ground Music. You have to update the 'number of CD's in the magazines' in service level 1 button 5 if you insert a lower number of CD's than 100 (factory pre setting).

1.6. Remove magazines



You can pull out the magazines separately. By pushing the latch bar (1) inwards the magazine is released. At the same time the CD's are locked into place. Pull the handle bar (2) to remove the magazine completely. When you insert the magazine the latch bar clicks into place and releases the CD's.

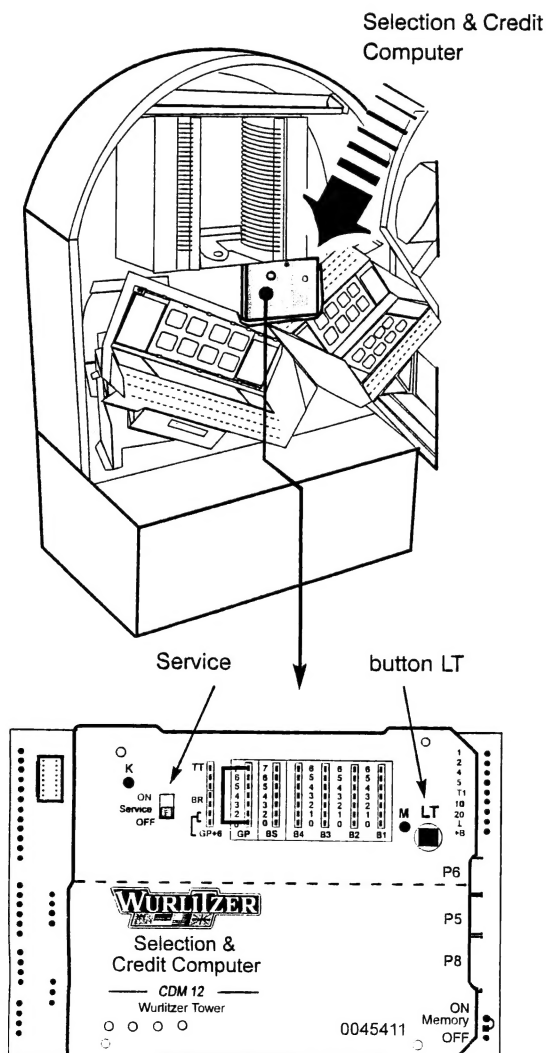
**IMPORTANT**

Always push the magazine into its frame until the latch bar clicks into place properly!

1.7. Programming number of CD's in magazines

level 1

button 5



You can lay the magazine on its back side. Note, that the left magazine contains all CD's with odd numbers, the right one all with even numbers. Insert the CD's starting with the compartment 01, in the LH magazine then insert the second CD into compartment 02 which belongs to the RH one etc.. The CD label has to face upwards.

Note:

In theory it is possible to use only one magazine. In this case the empty one has to be removed and the jukebox needs to be switched off and on once. After the initialisation run all selections belonging to the missing magazine are disabled. If e.g. the RH magazine is missing, all even selections are disabled. If the such a selection is made the digital display will flash.

You have to update the 'number of CD's in the magazines' if you insert a lower number of CD's than 100 (factory pre setting) or after a change of the number of inserted CD's .

At the rear wall inside of the jukebox cabinet the so-called Selection & Credit Computer is situated. Some units are equipped with a metal cover. But the switch "SERVICE" and the button "LT" are accessible through holes.

To program the number of inserted CD's (service level 1):

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 1. Service level 1 is reached. Display is: 1 _ _ .
5. To check the current setting press button 5, the display shows e.g. 50 or 00.
6. To reprogram press selection button 5 -hold down- and press selection button R. Enter the desired number of CD's with two digits (enter 00 for 100 CD's).

To check the new settings, press button 5 again.

Exit the serviceprogram:

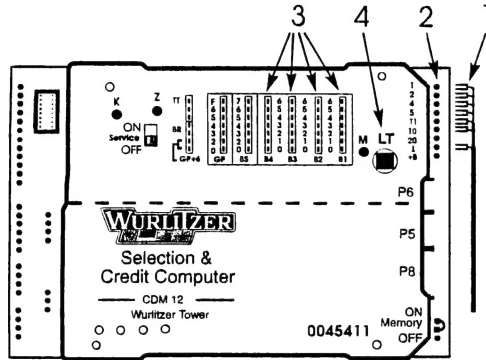
1. Set the slide switch 'SERVICE' at the SCC unit to OFF.
2. Press 'LT' button.

The changer starts an initialisation run. After this the jukebox is ready to operate.

2. Coin and price settings

2.1. Price settings

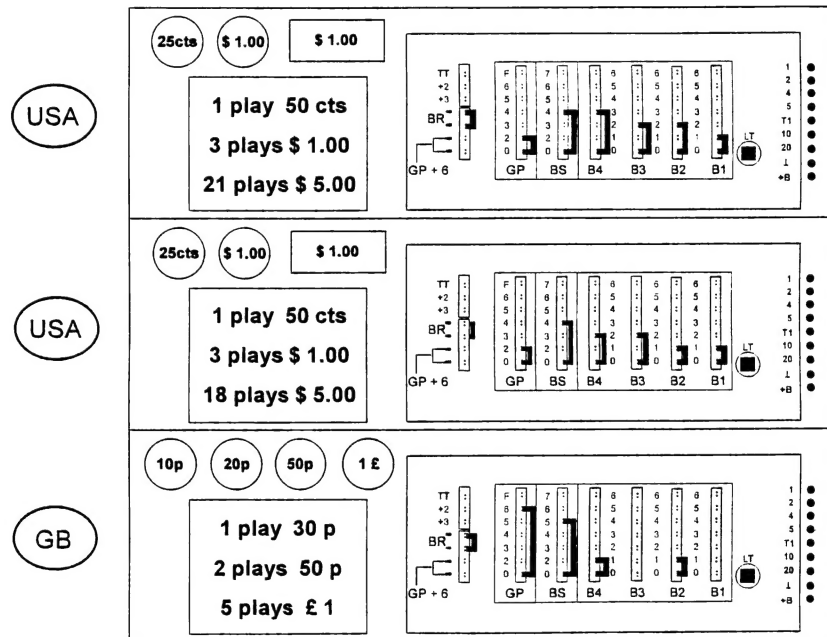
If other combinations are required, refer to the examples shown in chap. 2.6.



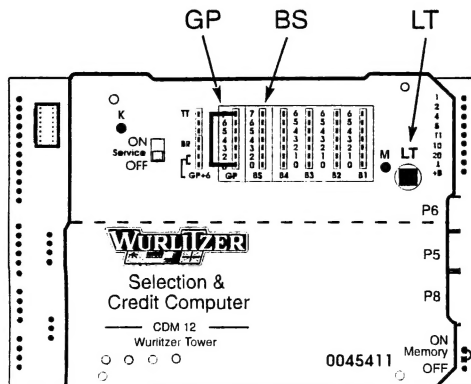
Usually the prices are preset by the factory according to the denomination label. In the "Unipack" version no play prices are pre-set. To set the play prices do the following steps:

1. Switch on the jukebox.
2. Coin output plugs (1) should be set according an separate attached instruction by connecting to the pin row (2) on the SCC unit. Pay attention to wiring colors (ref. to chap. 2.4).
3. Set the attached jumpers in B1 to B4 according to the number of the desired additional bonus plays. (3) (ref. to chap. 2.2)
4. Press „LT“ button once (4) to accept the new bonus setting.

2.2. Examples



2.3. Free play programming



Set a jumper from 0 to F (free play) in the row GP on the SCC unit.

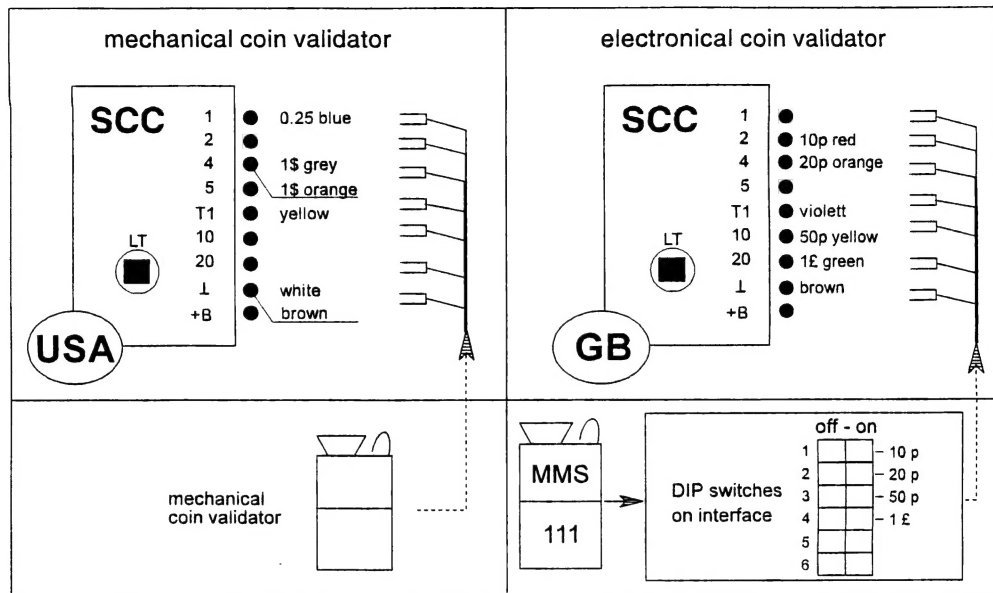
Press 'LT' button.

Now **one track** is selectable without coin insertion.

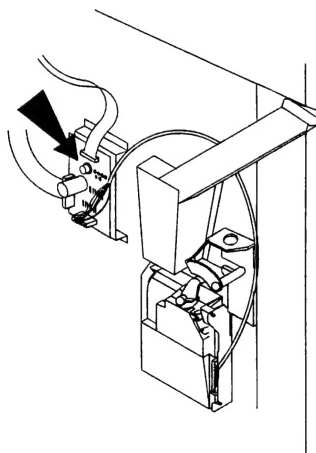
In between **two to six plays** are selectable by setting an additionally jumper in the row 'BS' (Bonus-Stufe, Bonus Step) from 0 to 2 or from 0 to 6.

Up to **47 tracks** are pre-selectable by setting a jumper in this row 'BS' from 0 to 7.

2.4. Color codes of coin inputs



2.5. Test credit



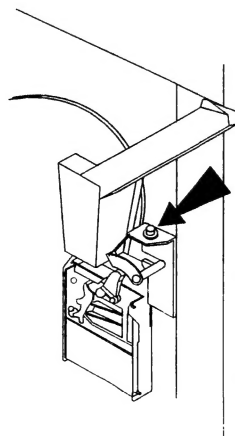
Position of the test credit button in jukeboxes with an electronic coin validator.

For repair and test purposes it is possible to give test credits. These credits will not be stored in the internal cash counter. At each pressing of the test credit button one credit will be given and also displayed in the digital display.

If an electronic coin validator is installed the test credit button is situated on the coin validator interface board. In jukeboxes with mechanical coin validator the test credit button is mounted over the return lever inside. The test credit input is marked on the SCC unit as T1.

Not used test credits can be erased by pressing the button 'LT' on the SCC unit.

Position of the test credit button in jukeboxes with a mechanical coin validator.



2.6. The bonus jumper system how it works

Statement: At the right hand side of the SCC unit are located the so-called coin inputs designated by the numbers 1,2,...10,20. These inputs are used to set a monetary value to the „basic unit“ the computer uses to figure credits. If no bonus jumpers are inserted and input 1 is shorted to ground by a coin validator the SCC gives one credit. This corresponds to a basic unit and will be called as one input pulse in the following description. In most applications one input pulse agrees to the lowest coin value. The terminals 2 to 20 give corresponding to their number 2 to 20 input pulses per coin insertion.

If no jumpers are inserted each input pulse switches the SCC unit to the next bonus step B1 - B4. This is first of all without result because no jumpers are set in the columns B1 to B4.

If there are jumpers set in B1 to B4 additional credits will be given corresponding to the reached bonus step and the jumper setting in this step.

Example: B1 is set from 0 to 3: By reaching the first bonus step (after one input pulse) one basic credit is given + 3 credits from the bonus step B1 = 4 credits will be displayed

If the same jumper is set in B2 and the next input pulse reaches the SCC unit, it will switch to the next bonus step

B2 and the credits given before the basic credit from the input pulse and the three credits from B2 will be added $4 + 1 + 3 = 8$ credits. This is repeated until B4 is reached.

If the jumper BR is set the SCC unit it will stay in step B4 until the next selection is made. At each input pulse the basic credit of this pulse and the bonus credits from step B4 will be given. If BR is not set the SCC will jump back to step B1 when B4 is overflowed.

A jumper in BS causes the computer not stepping at each input pulse to a new bonus step but moreover when two or up to seven input pulses have reached it. For example, if a jumper in BS is set from 0 to 4 the bonus step B1 will first be reached after 4 input pulses. B2 will be reached after the next 4 pulses.

A jumper in GP means that the computer will not give a basic credit at each input pulse, but will only give a basic credit after the programmed number of credits in GP.

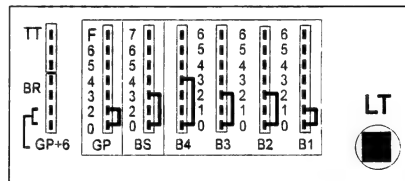
Example: GP: 0 -> 4 = 4 input pulses give one credit. This system is needed to enable the machine to deal with smaller coins as a nickel and to be able to interface with foreign coin systems.

The table below gives an example for the following jumper setting:

BR = no Bonus Reset (B4 repeat)

BS = Bonus Step

GP = Basic Price

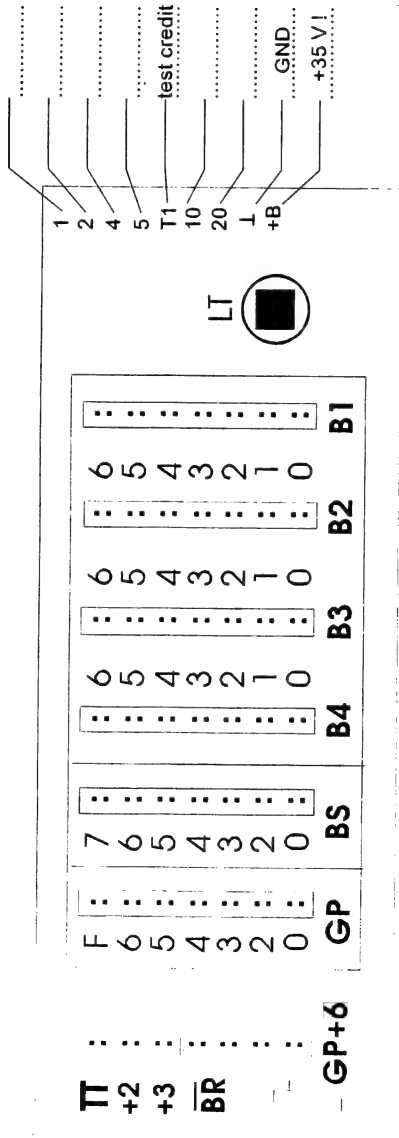
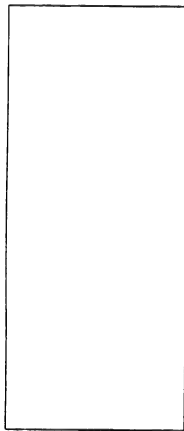


pulse	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
plays from GP	-	1	-	1	-	1	-	1	-	1	-
from bonus step			B1			B2			B3		
plays B1...B4			1			2			2		
total plays	-	1	2	3	3	6	6	7	9	10	10

pulse	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
plays from GP	1	-	1	-	1	-	1	-	1	-	1
from bonus step	B4			B1			B2			B3	
plays B1...B4	3			1			2			2	
total plays	14	14	15	16	17	17	20	20	21	23	24

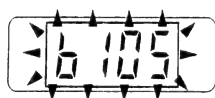
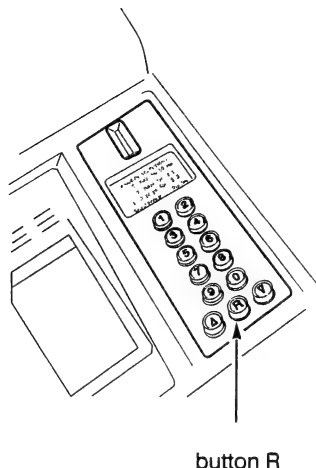
The table on the opposite page can be used as a copy template for your own calculations.

Price settings:



pulse	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.
inserted money																									
plays from GP:																									
from bonus step																									
plays B1...B4																									
total plays																									

2.7. Track selection



If credit exists or free play is set you can select tracks by means of the buttons 0 - 9 of the keyboard.

First enter the number of the CD with two digits, then the track with two digits too (track numbers higher than 35 will not be accepted).

Example: CD 2, track 9: Enter 0 - 2 - 0 - 9.

(Exception: CD 100 = 00.)

You can delete wrong entered numbers up to the third digit by means of the button R (Reset). But after having entered the fourth digit the jukebox stores and executes a selection also made by mistake. By pressing the button R the available credit will be displayed for a few seconds.

After entering the fourth digit of a selection the jukebox starts to search and play the selected CD immediately. If the display flashes the entered selection was not valid. Check:

- if credit is available or
- if the selection is higher then the programmed number of CD's in magazines

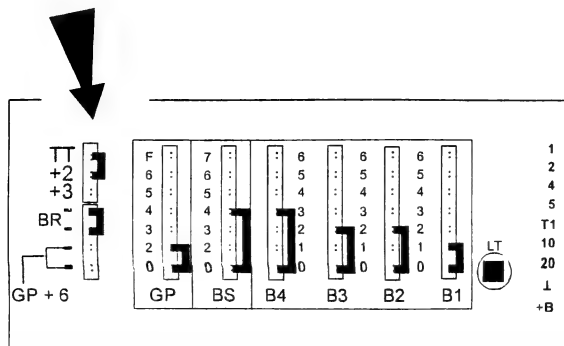
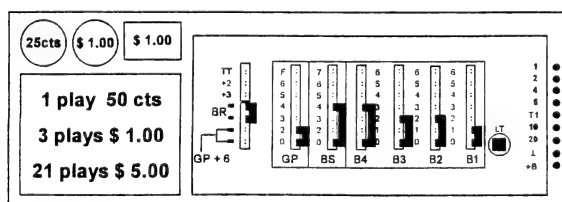
If you select a higher track number as available on a CD. The jukebox overcounts the tracks and stats at the beginning. Example:

CD 03 contains 17 tracks. But selected track is 0 - 3 - 1 - 9.

The jukebox plays track 02 of CD 03.

2.8. Selecting, displaying and programming of the top tunes

As example we use the US price settings
50 cts 1 play, 1\$ 3 plays, 5\$ 21plays :



You can select the most played tracks (top tunes) by selecting 9999 in the normal operation mode. Condition is that the 2nd bonus step (B2) of the jukebox is reached by coin insertion. The total number of played tracks depends on the bonus price settings of the first two bonus levels (B1 and B2, ref also to chap. 2.6). Additional to this setting the jukebox plays one track more.

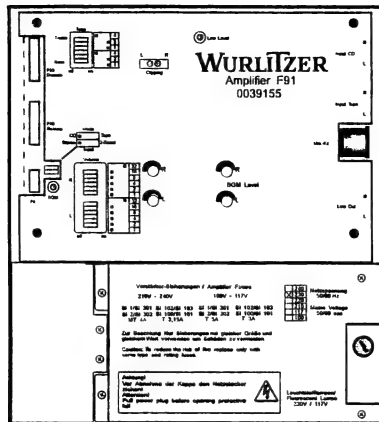
After having reached the bonus level 2 the SCC unit gives 7 credits (4 basic credits total + 1 bonus credit from B1 + 2 basic credits from B2 = 7 credits total). If you select the top tunes with 9999 the jukebox plays one track more (= 8 tracks).

If you set an additional jumper from TT (Top Tunes) of the SCC unit to +2 the jukebox plays two additional tracks (in our example 9 tracks).

If you set a jumper from TT to +3 the jukebox plays 3 additional tracks (in our example 10 tracks).

To find out what tracks will be played after selecting 9999 you can display the single tracks by entering 9998. At first the most played track will be displayed. Than you have to enter 9998 again and so the jukebox shows the second most played track etc. To display the tracks the SCC unit needs about 2-3 sec for calculation. If the display starts to flash press the selection button R once.

3. Amplifier F91

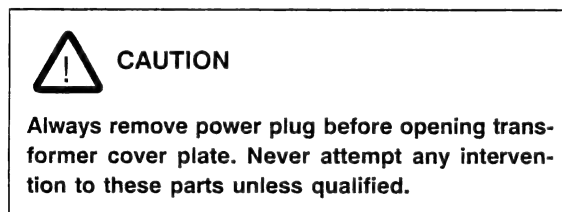


The amplifier F91 is the version with higher power output (2 x 170 W rms.). Equipped with protection and watch dog functions described below. The BGM adapter (to attenuate the volume in BGM mode) is integrated. The volume of CD's with different recording levels is kept constant automatically.

In 2-channel mode it is possible to control both channels with the IR-remote control. The total output power of the F91 can be used fully only with external speakers.

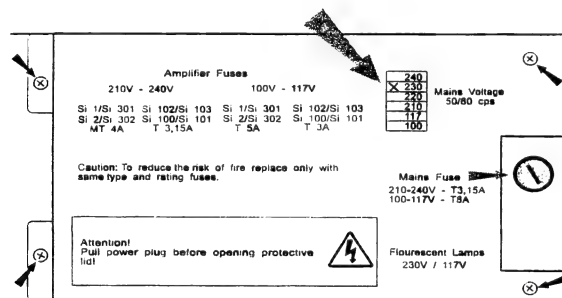
You can also make selections with the optional infrared remote control.

3.1. Verification of power voltage



The power voltage setting is on the cover plate of the F91 transformer. Machines for USA are set to 117 V. Jukeboxes „UNI-Pack“ are shipped in 230 V setting. This is marked on the machine label on the rear wall. If the voltage setting is not clear the transformer cover plate has to be removed.

The main fuse (T3,15 A, res. T8 A for 117V) is located near the RH. side of the cover plate.



Loosen the four screws to remove the cover plate (small arrows).

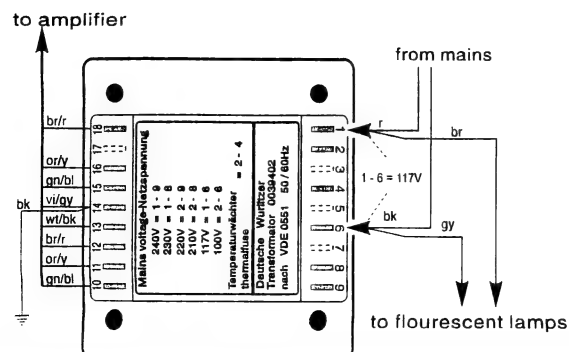
The position of the two plug connectors on the transformer terminals 1 to 9 (primary side) indicates the current voltage setting. The following combinations are possible:

$$240V = 1 - 9$$

230V = 1 - 8

$$220V = 2 - 9$$
$$210V = 2 - 8$$

117V = 1 - 6

$$100V = 2 - 6$$


Never connect the fluorescent supply to other contacts .

If you intend to change the power voltage for a higher voltage (e.g. from 117V to 230V) it is better to use a subtransformer for the fluorescent lamps or change the ballast according to the used voltage (e.g. for 230V).

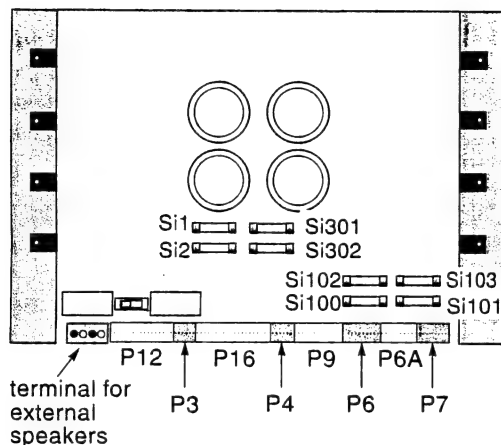
The power consumption in standby is approx. 190W. With max. volume it is approx. 546W.

3.2. Position of fuses and plug connectors on the power stage



CAUTION

A voltage of approx. +60V res. - 60V applies to the fuse terminals also a certain time after power off. Change the fuses with caution !



Usually the jukeboxes are fitted with fuses of DIN 41571 (5x20 mm) slow blow or medium blow. Slow blow fuses of DIN standard bear the letter T (T = "Träge") e.g. T 4/250 means T = slow blow, 4 amps, 250 V maximum operating voltage. Which fuses have to fit in where is printed on the power transformer cover. Fast blow fuses (F = Flink) are unsuitable for the jukebox.

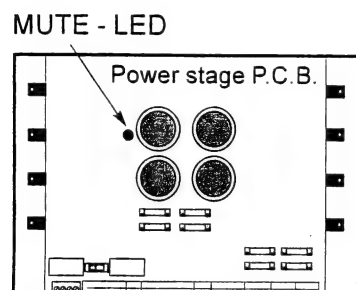
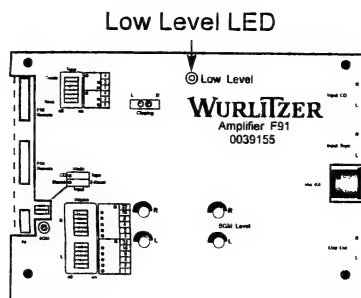
The fuse holder on the amplifier P.C.B. are capable to hold also fuses of 6x32 mm size.

Position of the plug connectors:

- P12 - jukebox speakers
- P3 - bubble tubes
- P16 - power transformer
- P4 - CD sub transformer, CD player
- P9 - mechanism, Selection and Credit Computer
- P6 - option, coin interface
- P6A - option
- P7 - service

Fuse	Failure
Main fuse T 3,15,res. T8 A for 110/117 V.	No illumination, machine completely dead.
Fuse Si1: T4A (T5A) +70V= L.H. channel power stage	No sound in the L.H. channel. Speaker relay is not energized. According green LED does not light.
Fuse Si2: T4A (T5A) -70V= L.H. channel power stage	
Fuse Si301: T4A (T5A) +70V= R.H. ch. power stage	No sound in the R.H. channel. Speaker relay is not energized. According green LED does not light.
Fuse Si302: T4A (T5A) -70V= R.H. ch. power stage	
Fuse Si100: T3,15A (T3A) supply -30 V=	The jukebox operates normal. The CD2 mechanism does not use this voltage.
Fuse Si101: T3,15A (T3A) supply +30 V=	No initialisation run after power ON. All displays light. No function.
Fuse Si102: T3,15A (T3A) supply +12 V=	SCC unit dead - digital display dark (except red LED M still lighting up on coin insertion). The LED's K and Z on the SCC unit are dark . No initialisation run after power ON.
Fuse Si103: T3,15A (T3A) supply 30V ~	The digital digit on the CD-control is dark . Power supply for CD player and control unit is interrupted. Credit circuit via LED M is interrupted. If credits are still in memory or free play is programmed, a CD will placed on turntable but is not spinning. After about one minute the CD is taken back.. If no credits in memory, no CD will be taken to turntable, the display is flashing.

3.3. The first power ON



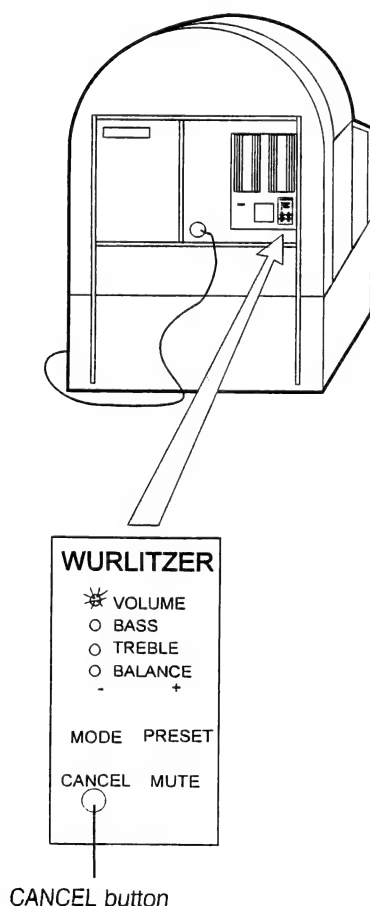
The mains switch is located at the rear side of the amplifier. It is reachable at the rear cabinet side of the jukebox. In position 'I' jukebox and amplifier are switched on. The amplifier is now in **STANDBY MODE**:

The yellow '**Low Level LED**' lights. The 'Low Level' circuit detects low music parts and pauses. It effects the AVC circuit not to raise the audio level in music pauses. So disturbing noises will not be heard. This LED may light for short times during play.

The yellow '**Mute LED**' lights (on the power amp board, only visible after lifting up the pre amp board). It indicates that the amplifier is muted.

To avoid power on and other noises, the amplifier output will be switched on only during play.

3.4. Volume and sound control



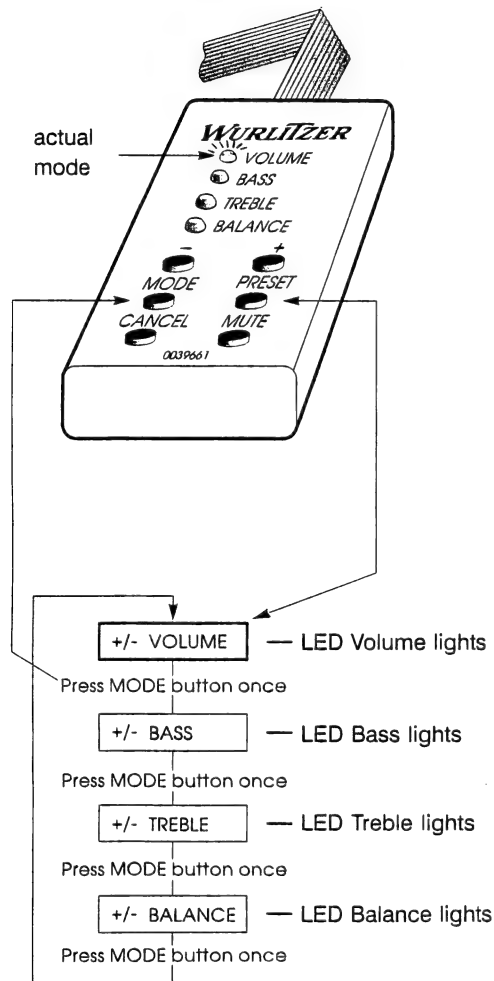
With the control terminal at the rear side of the jukebox the volume, treble, bass and balance can be controlled.

This unit can be taken out and be used as a wired remote control. If required its 10-line ribbon cable may be extended with any kind of wire. The voltage of the control wire is 5V DC.

As an option it is possible to connect two wired remote controls in parallel or one wired remote control together with one infrared remote control. The control mode is displayed with 4 LED's. The mode can be changed by using the 'MODE' button to control volume, bass, treble and balance:

**CAUTION**

Depending of the adjusted volume of the jukebox loudness levels more than 70 dB can be reached.

**CAUTION**

After power off all adjustments are reset to dip switch settings. For permanent adjustment e.g. treble, bass use the dip switches (ref. to chapt. 3.5).

After power up or if no button has been pressed for approx. 5 sec or after the button PRESET has been pressed, the terminal stays in the mode "VOLUME". The LED "VOLUME" lights. In this mode you can control the volume by means of the buttons '+' and '-'.

One LED each displays the other corresponding modes all reachable by pressing the 'MODE' button. With the buttons + and - treble, bass or balance can be controlled.

The meaning of the buttons...**VOLUME:**

Volume LED lights.

- + button increases volume
- button decreases volume.

- **BASS:**

Press 'MODE' button once.

Bass LED lights.

- + button increases bass volume
- button decreases bass volume.

- **TREBLE:**

Press 'MODE' button twice.

Treble LED lights.

- + button increases treble volume
- button decreases treble volume.

- **BALANCE**

Press 'MODE' button 3 times.

Balance LED lights.

- + button increases right hand channel volume and decreases left hand channel volume
- button decreases right hand channel volume and increases left hand channel volume.

- **MODE:**

Switches to the next operating mode. After about 5 seconds without operating any buttons, 'VOLUME' mode is resumed.

- **PRESET:**

Volume, bass, treble, and balance are set to the pre-set according DIP switch setting. Actual mode is set to 'Volume' (ref. to chapt. 3.5).

- **CANCEL:**

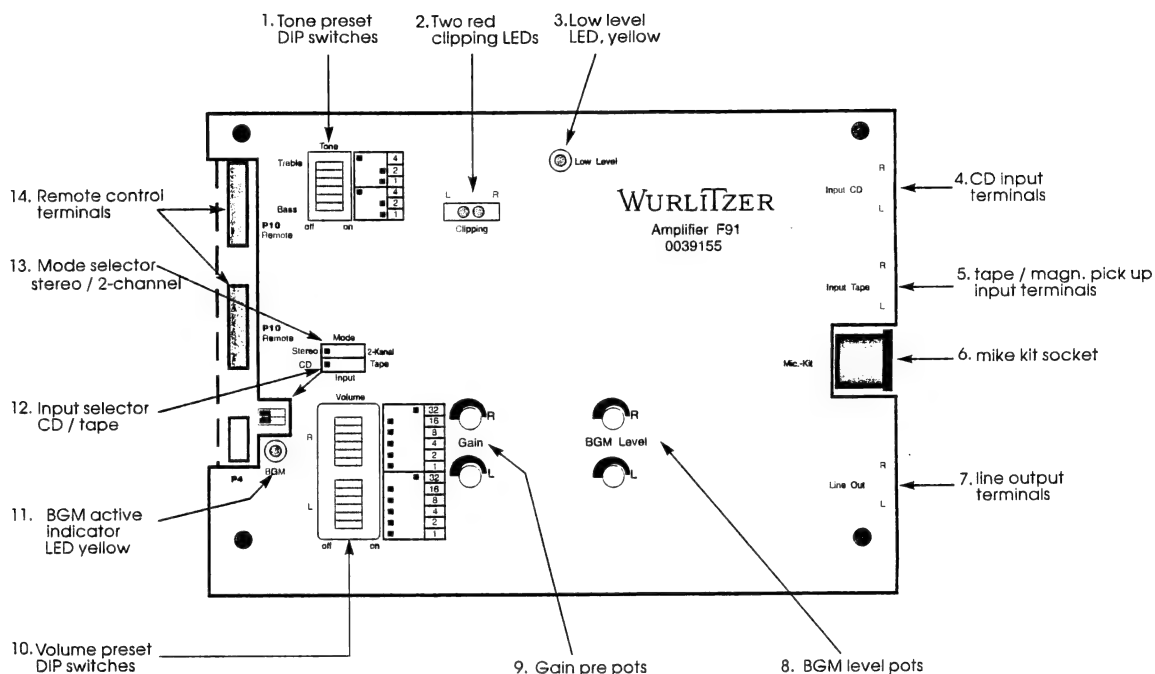
Rejects a playing track. If album play is selected the next track will be played.

- **MUTE:**

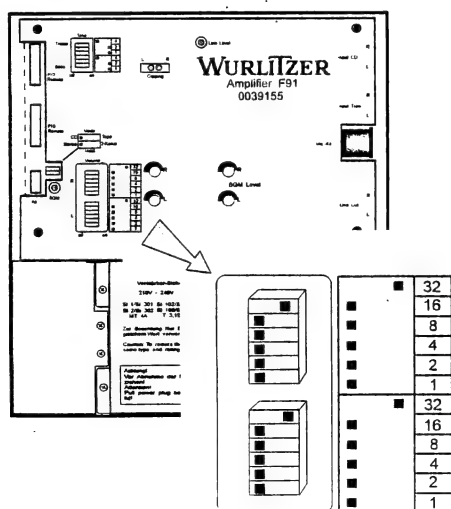
As long as this button is activated, the amplifier output is muted.

3.5. Pre-settings for volume, bass and treble

After power on of the jukebox or after pressing the button 'preset' the levels of volume, bass and treble will be set to basic values. These values can be set with different binary DIP switch combinations. The switches are located on the amplifier pre amp board. You can find the recommended settings on the amplifier cover.



3.5.1. Pre-settings for volume



DIP switches for volume pre settings

You can set the basic values for volume in 63 steps (to 2dB) from no up to maximum volume.

At the amplifier front side, opening "Volume", you can find 6 so called DIP-switches for each channel. These switches have different values (1, 2 ... to 32). If you add all the values of the switches in position "ON" you will get the value for the set volume. Consequently, the switches 32 and 16 allow a more coarse adjustment the others a fine.

The recommended factory settings are printed on the amplifier cover (32).

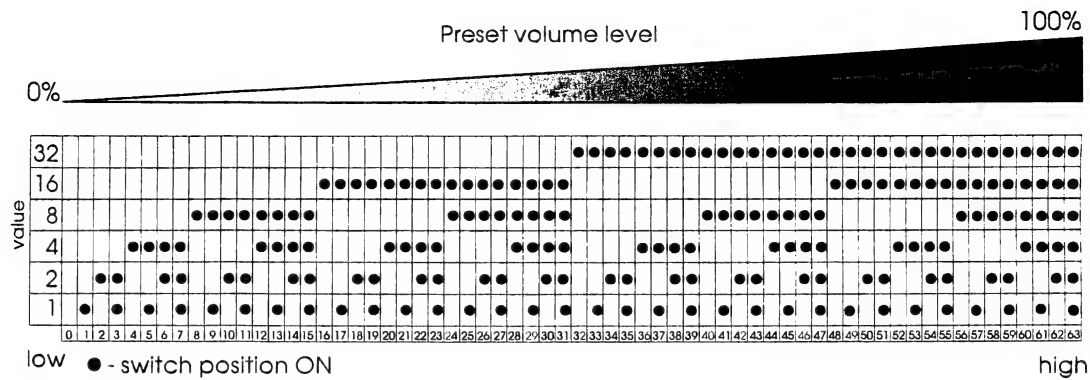
If you change the DIP-switch settings while the jukebox is operating remember that the new settings will only take effect after having pressed the button 'PRESET' at the control terminal or on IR remote.



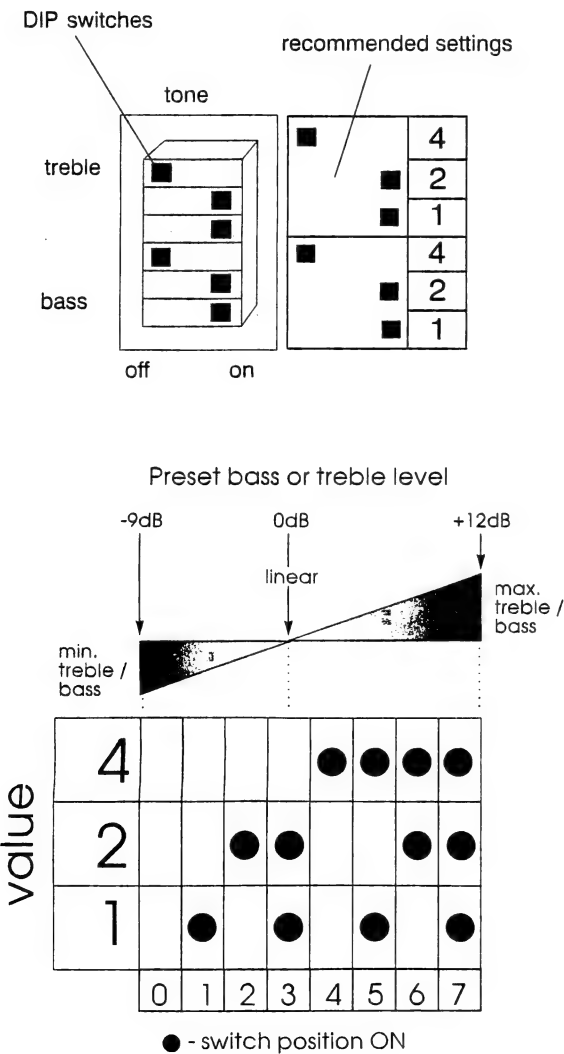
CAUTION

If all switches are in position OFF no volume, if all switches are in position ON, the maximum volume appears at power on !

Table of possible DIP switch settings for volume:



3.5.2.Pre-settings for bass and treble



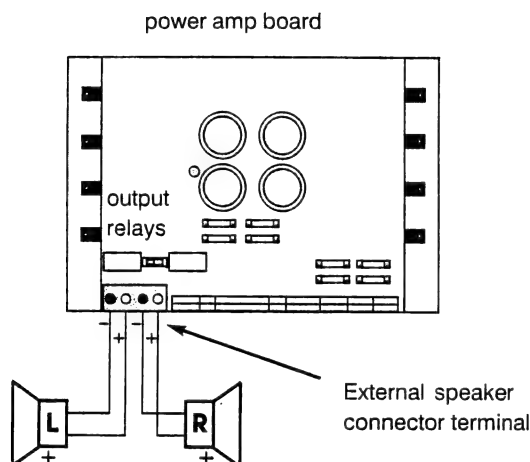
Like-wise the values for bass and treble can be set. However for both channels together.

Three DIP-switches with the values 1, 2, 4 are provided for each bass and treble. You can choose 7 different steps (to 3dB) from minimum (-9dB) to maximum (+12dB). Adding all switches set to "ON" gets the set value.

The 0dB - 'linear' position of these switches is printed as recommended factory settings on the amplifier cover. If you change the DIP-switch settings while the jukebox is operating remember that the new settings will only take effect after having pressed the button 'PRESET' at the control terminal or after a power off and on of the box.

Table of possible DIP switch settings for sound:

3.6. External speaker operation



To attain a good sound of the jukebox, take care when adding external speakers. Pay attention to the following requirements:

The minimum impedance of 4Ω per channel must not be exceeded. Therefore, in stereo mode the minimum impedance of an external speaker is 8Ω per channel. In 2-channel mode 4Ω per channel.

The power output of each channel at a load of $4W$ is $170W$, i.e. the min. power consumption of a 8Ω speaker set in stereo mode has to be $100Watts$. In 2-channel mode it is min. $170Watts$.

All speakers must be connected with the correct polarity.

To reach the terminals for external speakers on the power amp board first loosen the nuts (spanner caliber $7mm$) on the amplifier sides and tip up the amplifier cover (including the pre amp board).

External speakers may be operated as desired in the mode STEREO or 2-CHANNEL.

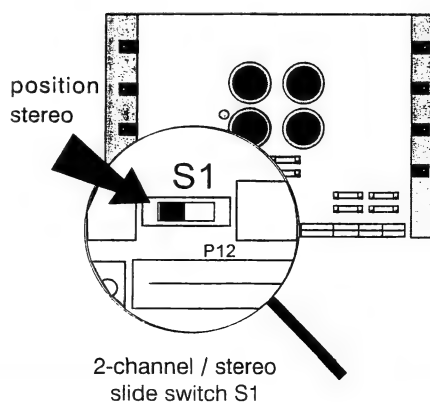
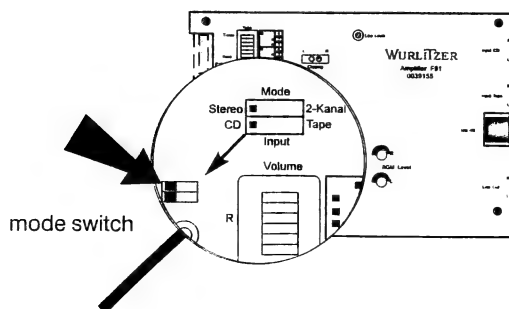
In **STEREO** mode the stereophonic reproduction survives, for example to improve the stereophonic sound in the same room.

In **2-CHANNEL** mode it is possible to control the volume of the external speakers independent to the internal speakers of the jukebox. It allows to reproduce the sound in a second room with different volume. The sound reproduction in this mode is only monophonic.

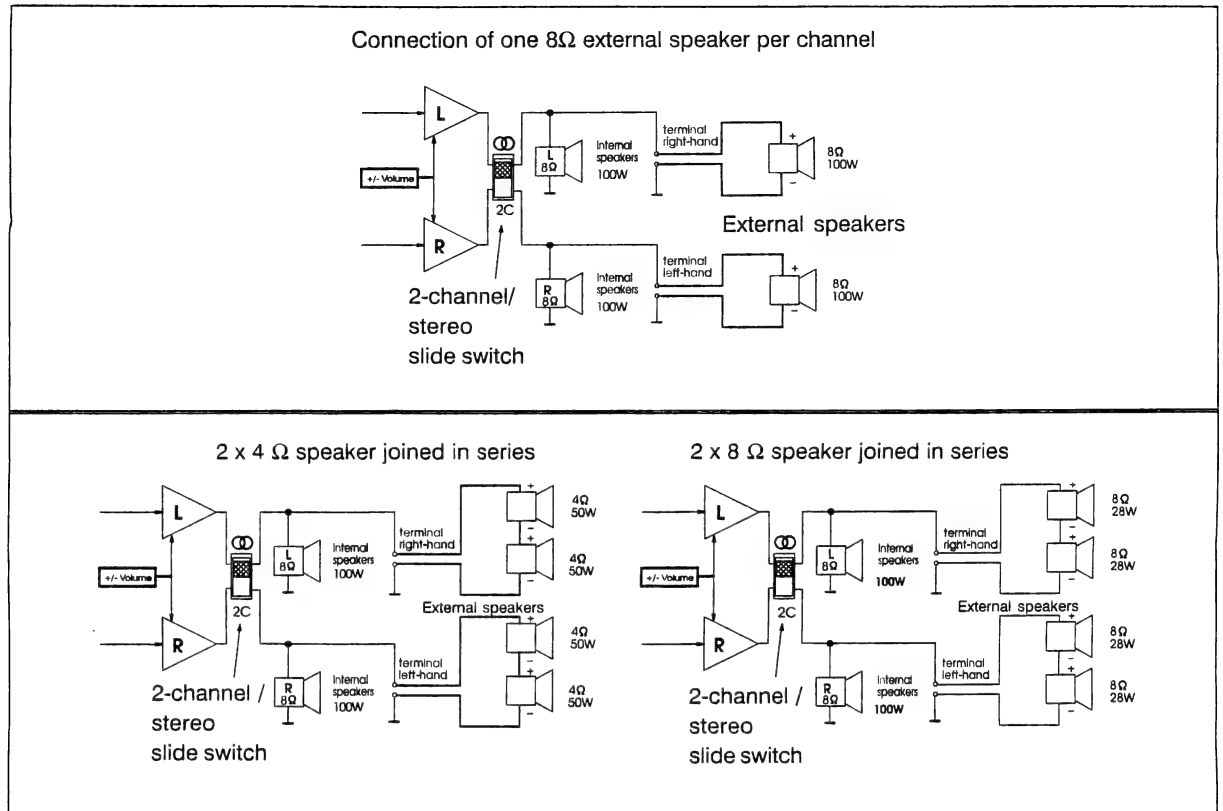
In 2-CHANNEL mode the volume of the internal speakers can be controlled in the mode 'VOLUME' and the volume of the external speakers in the mode 'BALANCE'. The according pre-set volume can be set separately.

3.6.1. Connecting external speakers in operating mode STEREO

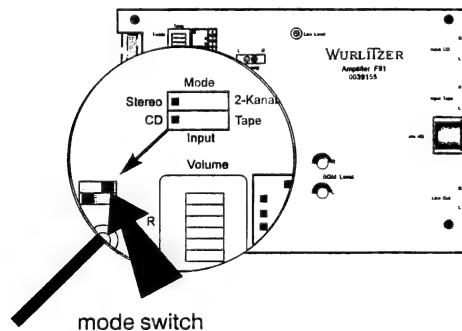
For normal operation the jukebox is set to the STEREO mode. Both amplifier switches, the mode switch and the slide switch S1 on the power amplifier board are set to position STEREO.



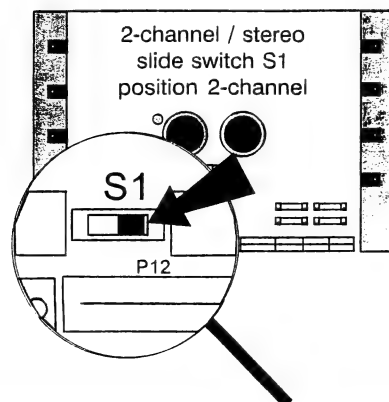
Examples:



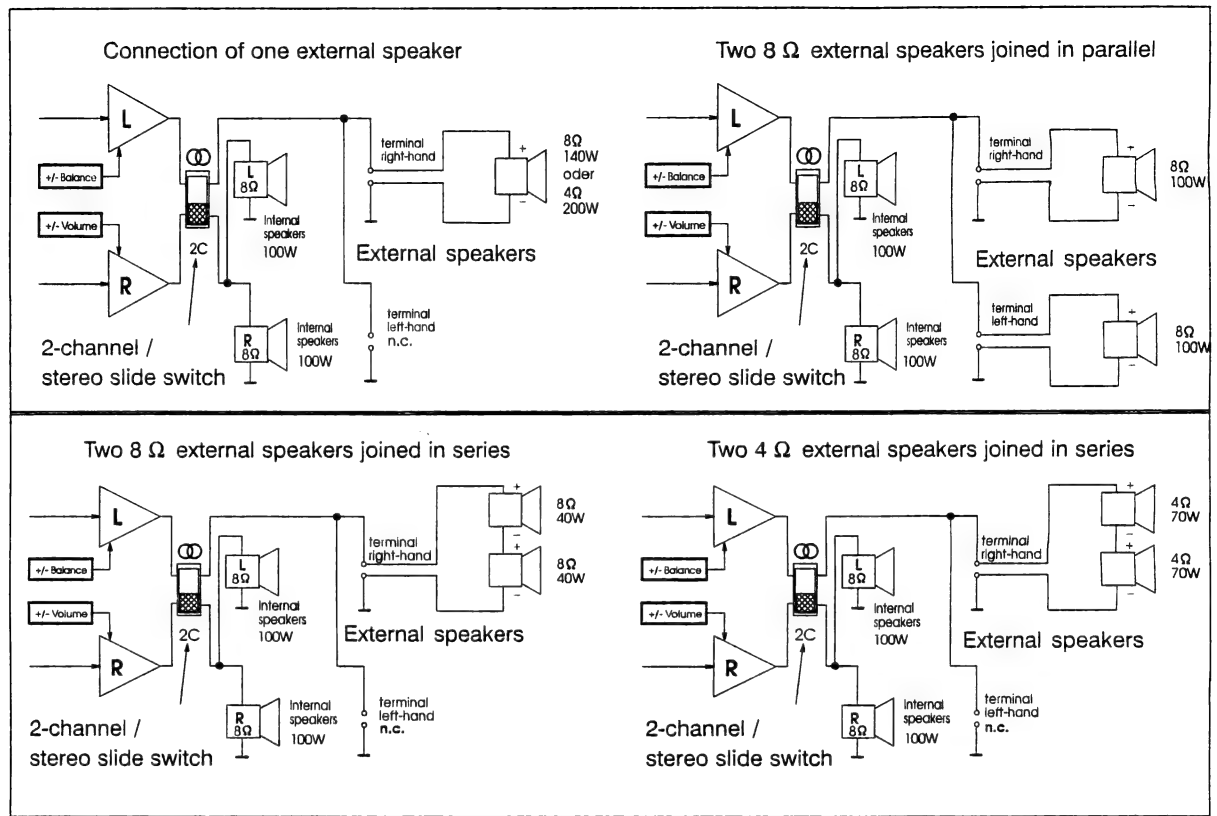
3.6.2. Connecting external speakers in operating mode 2-CHANNEL



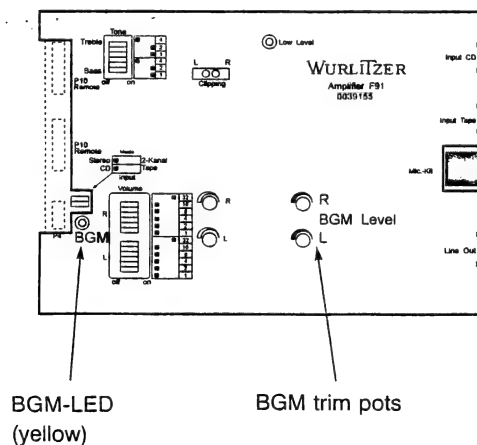
For 2-CHANNEL operation both amplifier switches, the mode switch and the slide switch S1 at the power amplifier board are set to position 2-CHANNEL.



Examples:

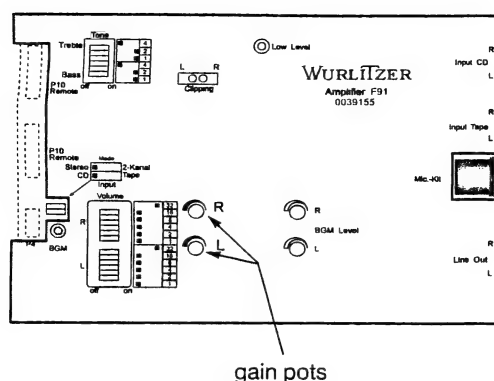


3.7. BGM mode - volume attenuation



In the BGM (Back Ground Music) mode the reproduction loudness will be reduced by a certain factor. This function is controlled by the signal „BGM“ pin 1 plug brown from the SCC unit. The active BGM mode is displayed with a yellow LED near plug P4. In this mode the volume attenuation from normal sound is adjustable by two BGM trim pots in the middle of the pre amplifier board.

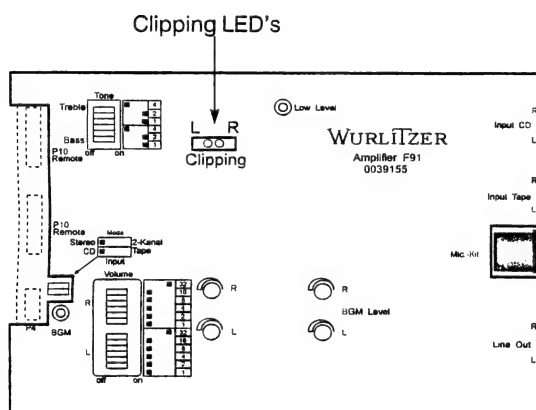
3.8. Automatic volume control (AVC) and clipping stage



The AVC sets CDs with different volume levels to an equal level. The level of CDs with a high level will be reduced, the level of low leveled CDs will be increased. This control works rather slow to save the dynamic range of the track.

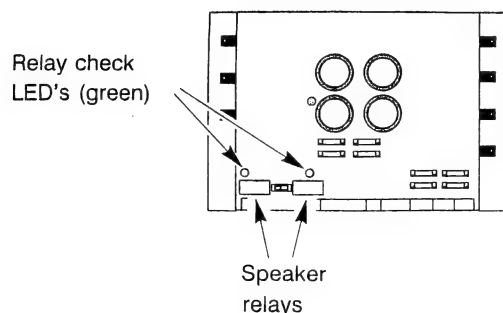
The pre amp gain pots are situated between the volume pre-set switches and the BGM level trim pots. These two pots are factory pre set should **not** be adjusted.

3.9. Overdrive protection



In case of an overdriven power amp one or both red clipping LED's will light. The clipping circuit will have an effect on the AVC circuit and the volume will be reduced. Occasional lightning of the clipping LED's during a loud performance is normal. Continuously lightning of one or both LED's indicates an overdriven channel and distortion can be heard. It is recommended to reduce the volume. Also additional speakers with an impedance lower than 8Ω (in STEREO mode) may cause an overload and the LED's will light.

3.10. Overload protection

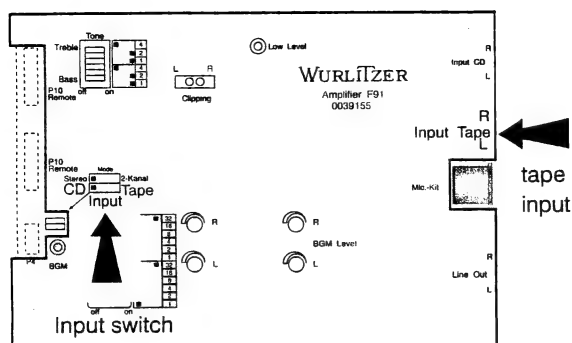


The power amplifier is provided with an overload protection circuit.

During a played CD two green LED's indicate that the speaker output relays are energized. If one of these LED's is dark during play and no sound appears an overload of the power amp stage has occurred, which is for example caused by a short circuit in the connection wires of any external speakers.

An additional internal watchdog circuit checks that the audio signal contains no DC Voltages, no high frequencies and no too high treble levels. It also indicates that the load limitation cut off has been reached. If only one test is not successful the relays will be switched off.

3.11. Tape input



Additional to the CD input a tape input with a higher input sensitivity is provided. As an option this input stage may be wired as a correcting network to work with a magnetic pick up (RIAA). Set the 'input' DIP switch to tape position to select the tape input.

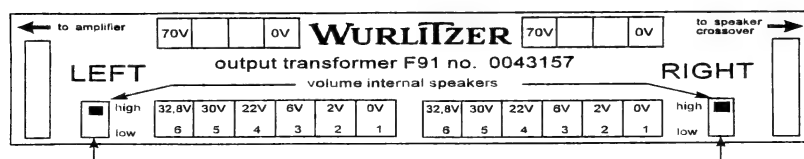
3.12. 70V - output transformer (0043157)

If external speakers with any other impedance than $8\ \Omega$ are to be connected or to work with 70V systems, we recommend to use the output transformer. Speakers between $2\ \Omega$ and $16\ \Omega$ could be connected additionally.

If external speakers are to be connected pay attention to the following hints:

1. To avoid an interruption of all speakers by the overload protection circuit or a decrease of volume by the clipping stage, the total power outlet of the amplifier should not be exceeded (ref. to chap. 3.10 page 22).
2. All speakers must be connected with the correct polarity.
3. To work each external speaker with the desired volume level, pay attention to the respective efficiency, impedance and load limit.
4. To avoid cable losses on long speaker lines (more than 60 feet) and low impedance's, 70Volt-systems should be used as much as possible.
5. If speakers with low impedance's ($2\ \Omega$, $4\ \Omega$) are used, each speaker should have its own line with sufficient cross-section.
6. When an output transformer is used **no** speakers should be connected to the terminals for external speakers on the power amplifier board P4A.
7. Note: The 2 - channel - option can not be used in connection with an output transformer without modifying the pre amp board.
8. The output transformer 40038, for the amplifier 184, must not be used for amplifier F91.

The switches 'volume internal speakers'



switches for internal speakers
L.H. channel

switches for internal speakers
R.H. channel

The internal speakers can be worked with reduced volume level. The switches for this function are situated on the connection board. In position HIGH the power consumption of the internal speakers is approx. 100 Watts, in position LOW approx. 30 Watts

Hints of connectable speaker loads

The maximum power output per channel is 170 Watts (rms). Depending on the position of the switches 'internal volume' a power rate of maximum 70 W (position HIGH) or 140 W (position LOW) per channel remains for external speakers.

The power consumption of external speakers could be

higher (i.e. 200 W) than the maximum remaining power outlet of the amplifier.

If the power consumption of external speakers is lower (i.e. 10 W) than the maximum remaining power outlet of the amplifier, it can be adapted by means of the output transformer.

Determination of the connectable speaker power

The real power consumption of a speaker equals the square of the voltage applied to the speaker terminals divided through the speaker impedance ($P = U^2 / R$). The power values calculated in this way are shown in the ta-

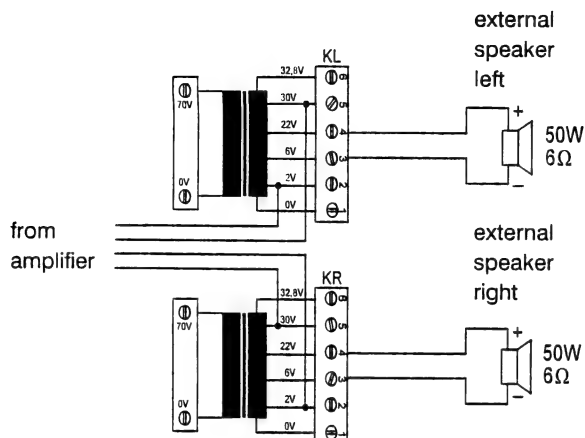
ble below. The volume level really delivered depends also on the speaker efficiency and varies from type to type, but it is possible to even out these differences in certain limits.

Note to the connection of external speakers:

delivered maximum power in Watt if speakers with an impedance of xx Ω are connected						voltage applied to the terminals in V _{rms}	terminal number and polarity	
16Ω	12Ω	8Ω	6Ω	4Ω	2Ω		pos	neg
		0,5	0,7	1	2	2	2	1
	0,7	1	1,3	2	3,9	2,8	6	5
1	1,3	2	2,7	4	8	4	3	2
2,3	3	4,5	6	9	18	6	3	1
4	5,3	8	10,7	16	32	8	5	4
7,3	9,7	15	19	29	58	10,8	6	4
16	21	32	43	64	128	16	4	3
25	33	50	67	100	200	20	4	2
30	40	61	81	121	*	22	4	1
36	48	72	96	144	*	24	5	3
49	65	98	131	196	*	28	5	2
56	75	113	150	*	*	30	5	1
59	79	119	158	*	*	30,8	6	2
67	90	134	179	*	*	32,8	6	1

1. If a high or a low amplifier outlet power for the external speakers is desired.
 - 140 Watts are available, if the switch 'internal volume' is in position LOW.
 - 70 Watts are available, if the switch 'internal volume' is in position HIGH.
2. The load of all external speakers has to be added.
 - If the total load of all speakers per channel is higher than the delivered amplifier outlet power, not all speakers may work with the maximum power.
 - If the total load of all speakers per channel is lower than the delivered amplifier outlet power, all speakers may work with the maximum power, a power reserve additionally.
3. For an efficient use of the speaker power the optimum impedance in conjunction with the output transformer connection possibilities has to be determined. (ref. to. connection example 3)

Connection example 1:

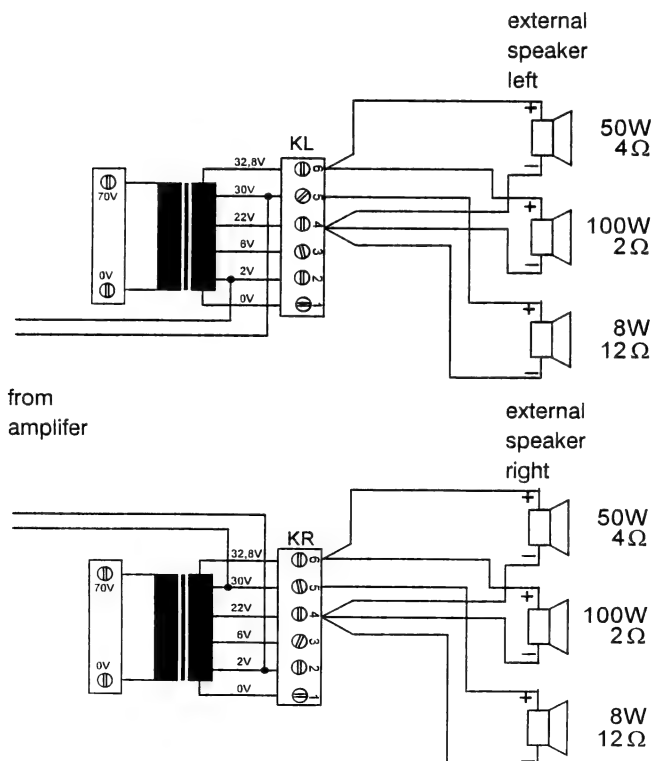


An external speaker of 50W 6Ω has to be connected per channel.

The load of 50W causes no amplifier overload. Possible connection combinations can be taken out of the row for 6Ω. For 50W all combinations up to 43W are possible. Lower power values also cause a lower volume level. To work with the maximum power the speaker have to be connected to the terminals 4 (+) and 3 (-).

Connection example 2:

Per channel should be connected:
 one speaker 50W 4Ω.
 one speaker 100W 2Ω.
 one speaker 8W 12Ω.



The total power rate is 158W, even in switch position LOW it is not possible to work with this high power. At first a look at the table :

1. Speaker 50W 4Ω (take out of row for 4Ω) can work with a maximum of 29W. The next higher value of 64W would cause an overload of the speaker!
2. Speaker 100W 2Ω (take out of row for 2Ω) can work with a maximum of 58W. The next higher value of 128W would cause an overload of the speaker!
3. Speaker 8W 12Ω (take out of row for 12Ω) can work with a maximum of 5,3W. The next higher value of 9,7W would cause an overload of the speaker!

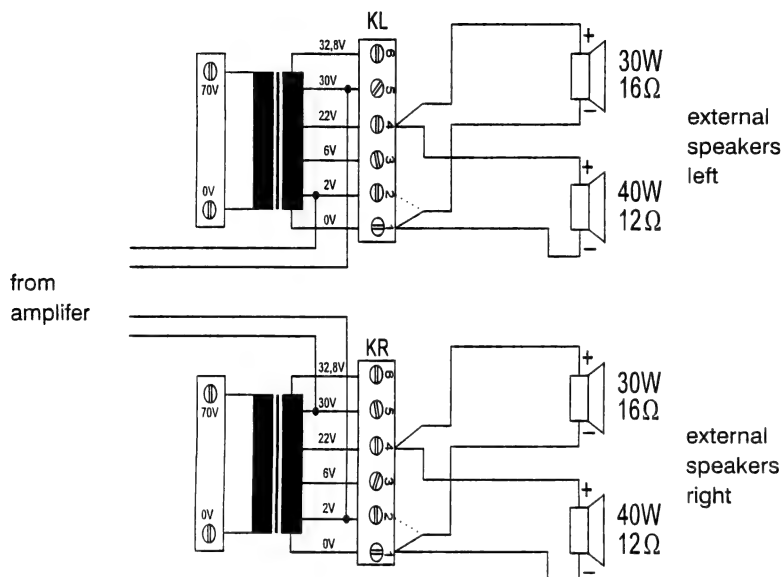
The power needed from the amplifier is added: $29W + 58W + 5,3W = 92,3W$. The amplifier is able to deliver this power assume that the switch 'volume internal speakers' is set to position LOW.

If the jukebox itself should work with a higher volume level compared to the external speakers (switch to position HIGH) the power consumption must be limited to 70 W. For example, by connecting the 100W 2Ω speaker to the terminals 5 and 4 for 32W (total: 66,3W).

Connection example 3:

On closer examination of example 2 it is showing that the speakers used, are not work with their optimum power. The speaker 100W 2Ω can only work with 58W. For a more optimal use, the desired speaker power has to be

included when the impedance will be selected. For example a 100W speaker with an impedance of 4Ω can work optimally with 100W at the terminals 4 and 2.



If an outlet power of 70W (switch position HIGH) should be used optimally, it can be effected by connecting one speaker 16Ω 30W to terminals 4 and 1 and one speaker 12Ω 40W terminals 4 and 1.

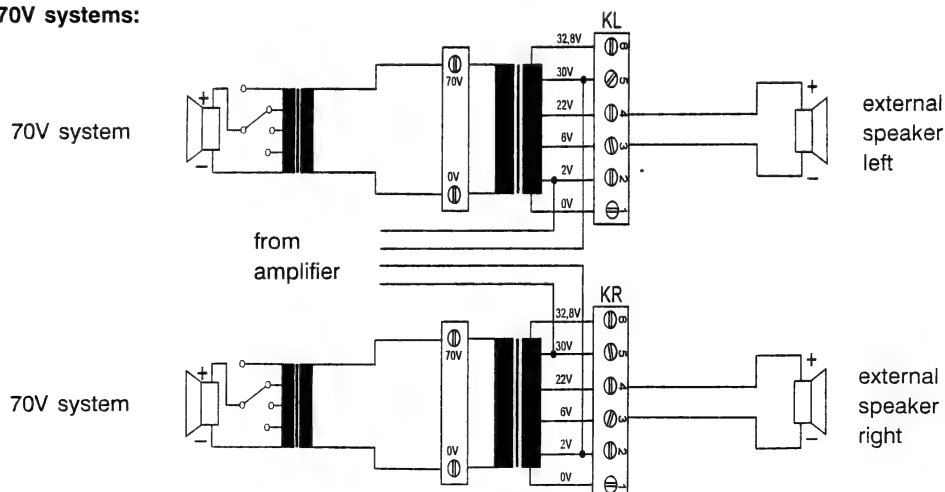
If you have the impression that the speaker 12Ω 40W is too loud it can be connected to the terminals 4 and 2. Due to that it will work only with maximum 33W, the sound would be reduced.



CAUTION

If you have the impression that the speaker volume is too low it must not be connected to higher power levels as indicated. This will damage the speaker!

Connection of 70V systems:



70V systems are intended for transmissions over long distances. They also have their own transformer in front of the speakers. The primary (input-)side of this transformer has to be connected in correct polarity with the 70V terminals of the Wurlitzer output transformer. It is not

allowed to consume more power than the amplifier is able to supply (70W or 140W), minus the additional speakers eventually connected to the output transformer. At some 70V - systems the load is capable of variation.

4. Amplifier I84

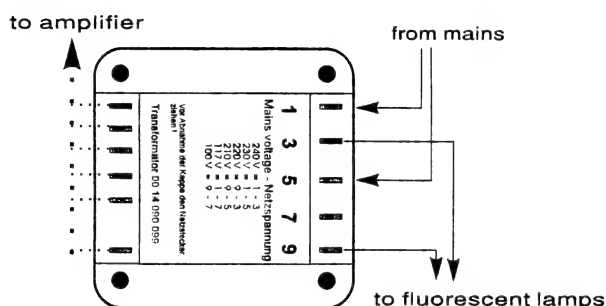
4.1. Verification of power voltage



CAUTION

Some parts of the electrical circuitry are connected to the power line (power transformer, fluorescent tube, ballast and associated wiring). Never attempt any intervention to these parts unless qualified! Always remove power plug before opening plastic cover!

Machines for USA are set to 117 V. Jukeboxes "UNI-Pack" are shipped in 230 V setting. This is marked on the machine label on the rear wall. Other machines with indication 100 - 240V on the label have a transparent cover on the power transformer so that the terminals 1 - 3 - 5 - 7 - 9 indicate the actual power voltage setting. The following combinations are possible:



240 V	= 1 and 3
230 V	= 1 and 5
220 V	= 9 and 3
210 V	= 9 and 5
117 V	= 1 and 7
100 V	= 9 and 7

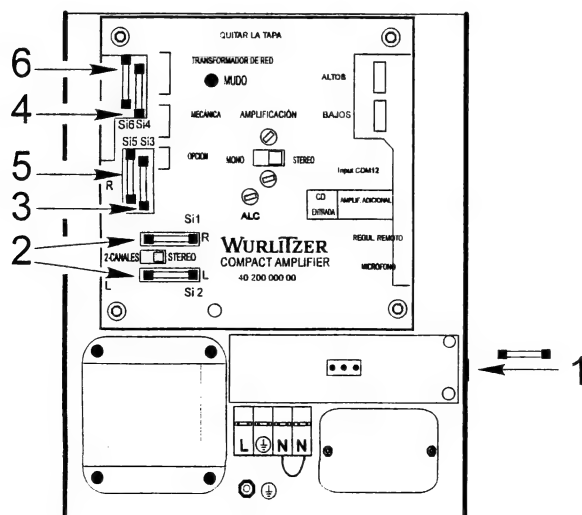


IMPORTANT

The power supply for the fluorescent lamps is 230V. Always connect their wires to the pins 1 and 5 of the transformer.

The power consumption in standby is approx. 190W. With max. volume it is approx. 250W.

4.2. Fuses. Which one controls what circuit?



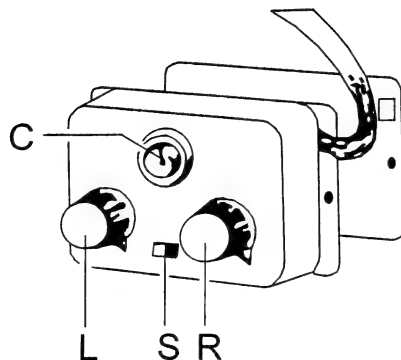
Usually the machines are fitted with fuses of DIN 41571 (5x20 mm) slow blow. Slow blow fuses of DIN standard bear the letter T (T = "Träge"), hence T 3,15 is the proper type to be used. All fuses in the amplifier are rated T 3,15 250V.

The open holders of the LT fuses are capable to hold either 5x20 mm fuses of DIN 41571 standard or fuses of 6x30 mm size. Fast and medium blow fuses are unsuitable for the machine.

Only exceptions are countries with 110/117 V supply where a fast blow fuse of 6,3 Amps (F 6,3 of 6x30 mm size) is used for the primary main fuse.

Fuse	Failure
01. Powerfuse : T 3,15 ; for 110/117 V: F6,3A.	No illumination, jukebox completely dead.
02. Fuses Si1 and Si2 : Speaker fuses	No sound on LH channel (Si1) or RH channel (Si2); the reason for a blown fuse here might be a shorted power transistor.
03. Fuse Si3 : supply -30 V to ground	Green LED on the amplifier does not light. After power on the jukebox does not initialize itself. After some seconds the fuse Si4 blows too. No function. In some cases the display shows the code 254 - total error.
04. Fuse Si4 : supply +30 V to ground	Amplifier is muted, even though the red LED (mute) is off. After power on the jukebox does not initialize itself. No function.
05. Fuse Si5 : supply +12 V=	SCC unit dead - digital display dark (except red LED M still lighting up on coin insertion). The LED's K and Z are dark too. After power on the jukebox does not initialize itself.
06. Fuse Si6 : supply 30V ~	The one figure display on the CD controller is dark . The power supply for the CD controller and the player is interrupted. Credit circuit via LED M is interrupted. If credits still exist or free play is set a CD will be placed on the turntable but does not spin. After approx. 1 min. the CD will be taken back. If no credit exist no CD's will be placed on the turntable, the display flashes.

4.3. Volume control

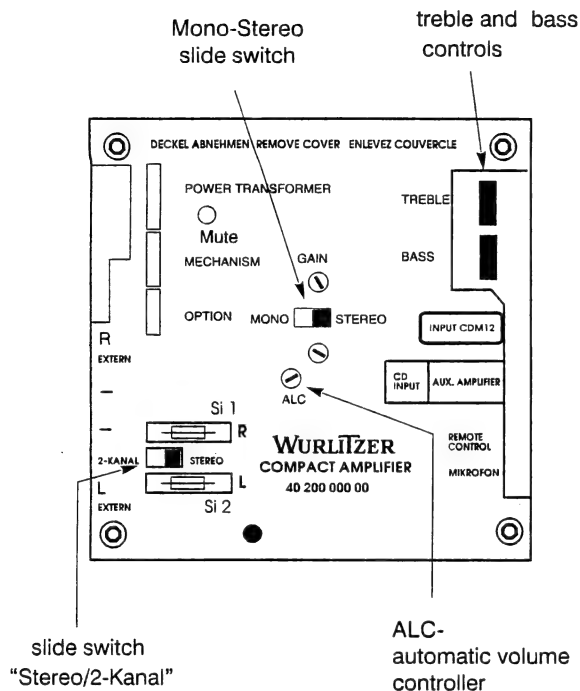


The volume control of the amplifier, accessible from the rear of the jukebox, is a separate unit and is connected to the amplifier via a DIN 45322 plug. This unit can be screwed off and may be used as a remote control. Its 5-line ribbon cable may be extended as required with any kind of wire. The voltage of the control wires is 5V DC. The control has two volume knobs. One for the left hand channel (L) and one for the right hand channel (R). In mode 'stereo' (switch S in position stereo) only the left knob is effective. In position '2 Kanal' (two channel) of the slide switch both channels are controllable separately (balance likewise).

An internal automatic volume controller decreases the volume level of CDs recorded too loudly to a defined output level, so that an equal volume level is reached. The ALC pot is pre-set from the factory. In left position of the adjustment pot the ALC does not operate. The separate 'Cancel' button (C) allows to reject a playing track.

4.4. Treble and bass controls

The treble and the bass controls at the top RH-side of the amplifier may be set to any position to suit local acoustic requirements. The Mono-Stereo Switch may also be set to either position, however, it must be set to 'Stereo' if a stereophonic reproduction is desired.



4.5. Slide switch "Stereo/2-Kanal"

In common operating mode the slide switch "Stereo/2-Kanal" is in position "Stereo". In position "2-Kanal" the cabinet speakers of the jukebox are switched to the left amplifier channel. Both sockets for the external speakers are switched to the right amplifier channel.

If the slide switch of the volume control unit is switched to "2-Kanal" a separate control of both cabinet speakers and external speakers (e.g. in another room) is possible (left knob for inside, right one for outside).

The slide switch "Mono-Stereo" has to be set to mode "Mono".

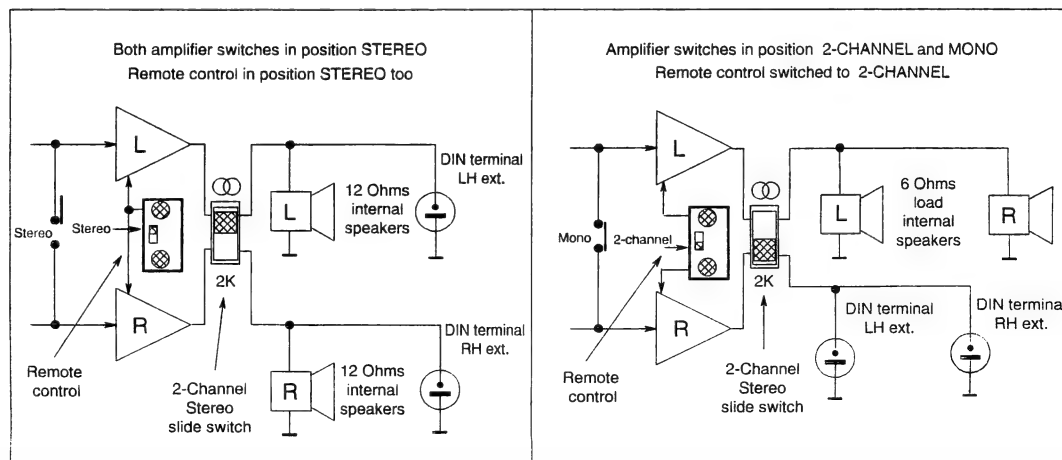
4.6. Maximum amplifier load and external speakers of I84

The amplifier may not be loaded with more than 4 Ω per channel (less Ohms means more load!). If the amplifier is operating in 2-Channel mode, the speakers are all loaded to the left hand channel. The impedance of all external speakers per channel in "Stereo" mode should not be less than 8 Ω , because the cabinet speakers represent a load of already 8 Ω per channel.

If the amplifier is operating in 2-Channel mode, the speakers are all loaded to the left hand channel. The right channel (now switched to the sockets "R-Extern" and "L-Ex-

tern") now may be loaded with a minimum of 4 Ω .

The output to a 4 Ω load is 70 Watts sinus power at 1 % distortion, to 12 Ω it is about 24 Watts, to 24 Ω it is about 12 Watts. That means, that e.g., a 12 Ω speaker connected to the external channel at Dual Channel operation must be a type of at least 24 Watts, otherwise the speaker is in danger of destruction at higher volumes. Note that speaker groups like in hi-fi boxes may have, at certain frequencies, impedances much lower than their rating.



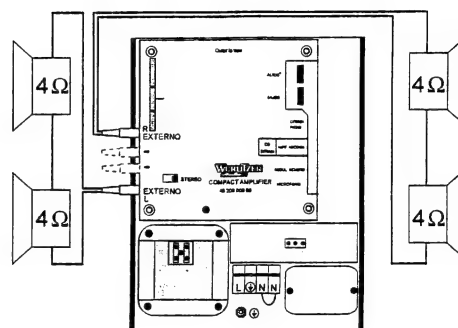
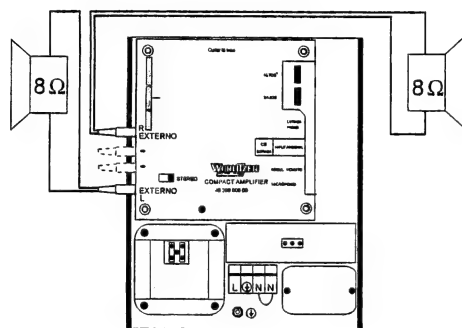
4.7. Connection of external speakers



CAUTION

In "Stereo" mode do not connect a single speaker with less than 8 Ω to the amplifier!

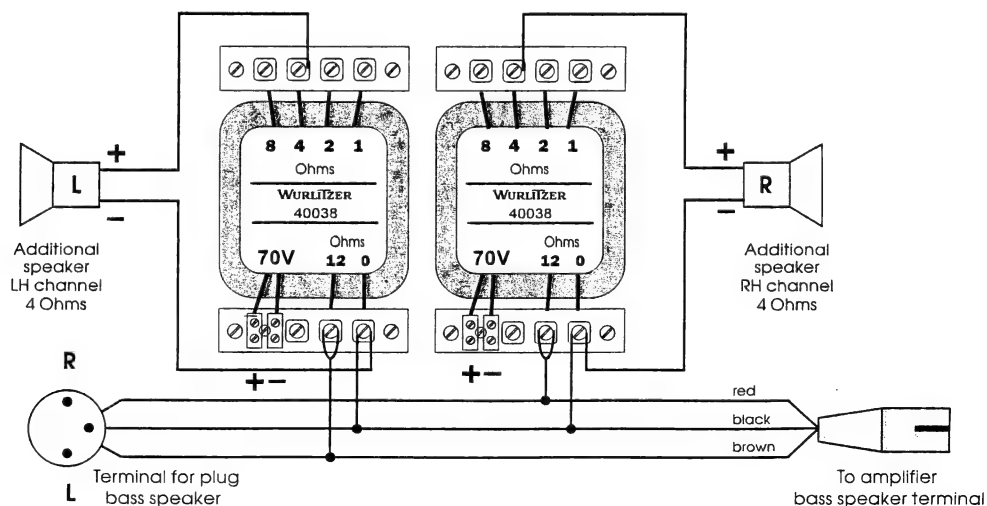
Additional speakers may be connected via two speaker DIN plugs to the amplifier.



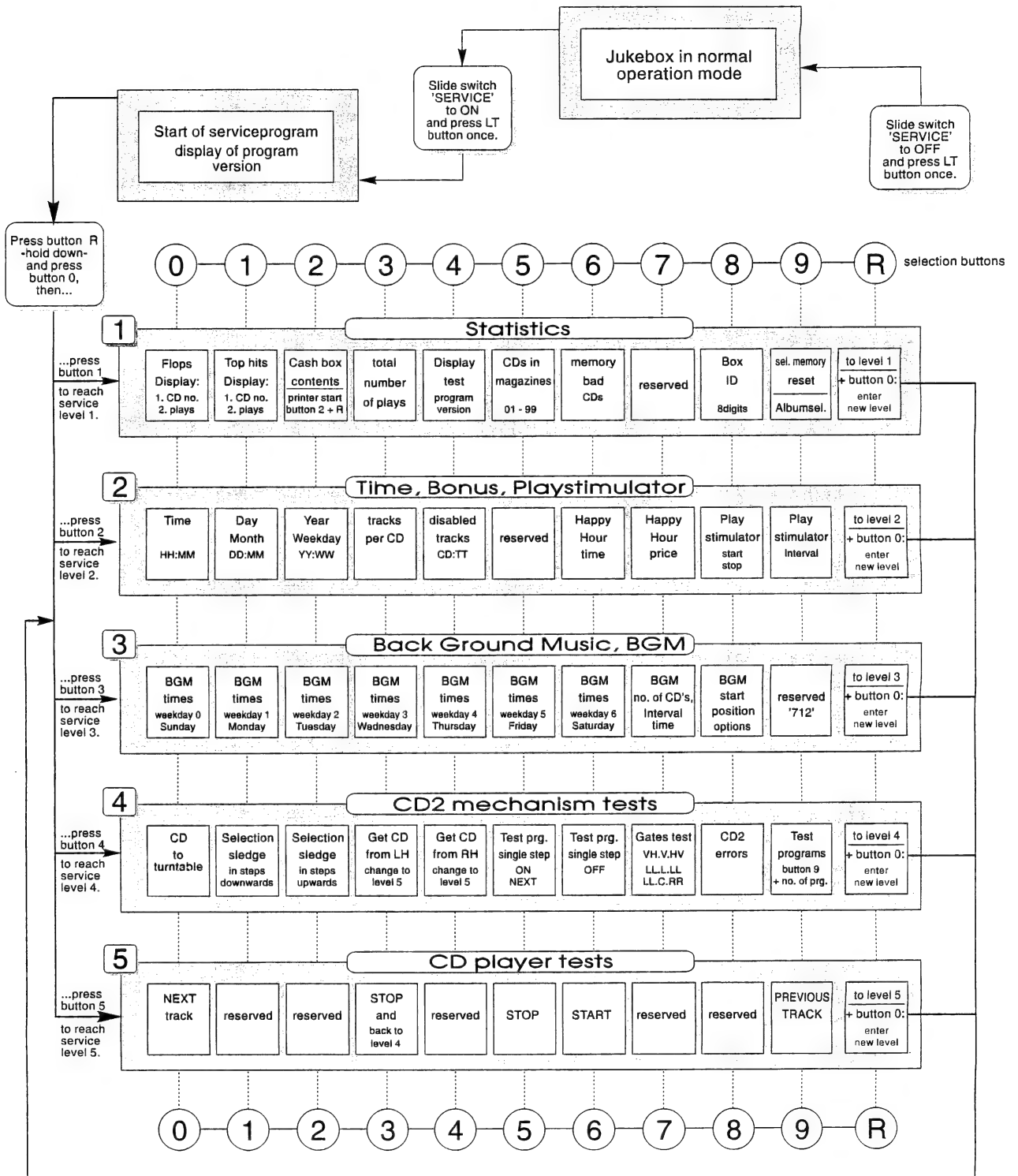
Two speakers of 4 Ω connected in series also represent a total impedance of 8 Ω .

4.8. 70 V output transformer (part no. 0006926)

If you want to connect external speakers with an impedance of less than 8 Ω or want to handle with 70 V systems on long distances an output transformer is deliverable. So you also can connect speakers with impedances between 1 Ω and 12 Ω additionally:



5. Programming short view



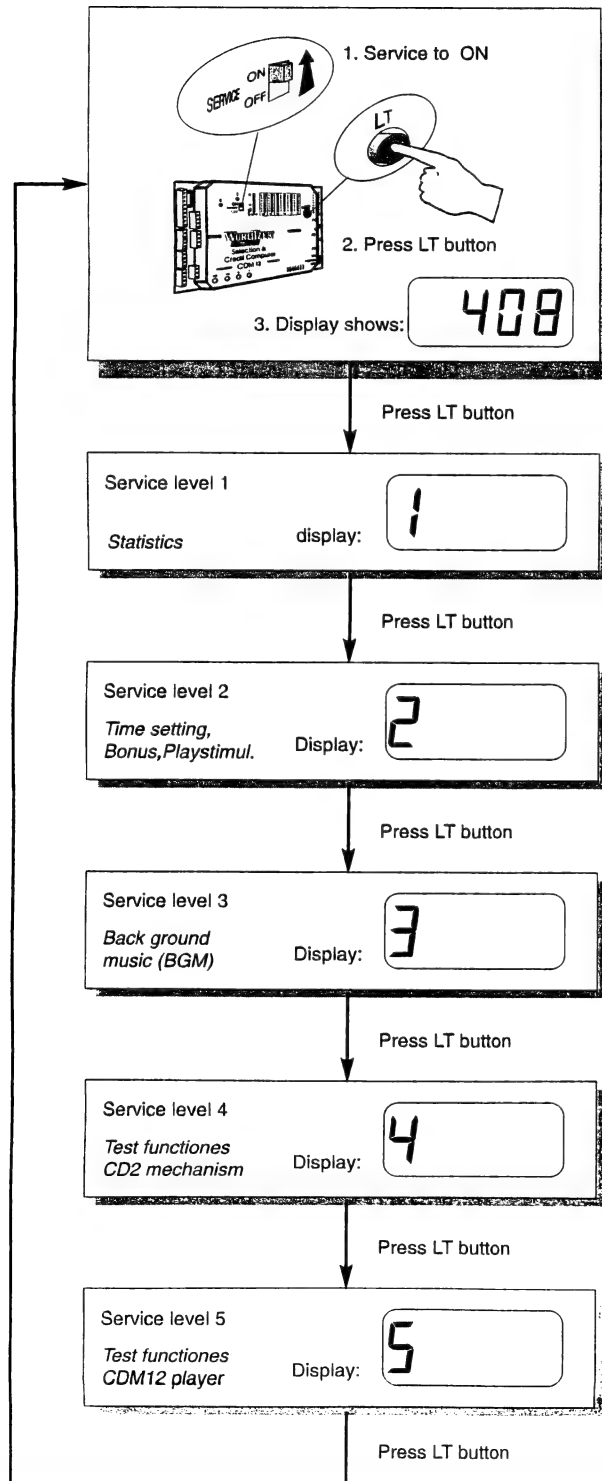
Programming: Press according button - hold down - and press selection button R, release both buttons and enter the new value.

TO CLEAR CREDITS PRESS LT BUTTON w/ service off

6. Jukebox programming

Additional features like Playstimulator, BGM time and Happy Hour time are programmable. These features are programmable in the service mode of the SCC unit.

6.1. Calling service programs

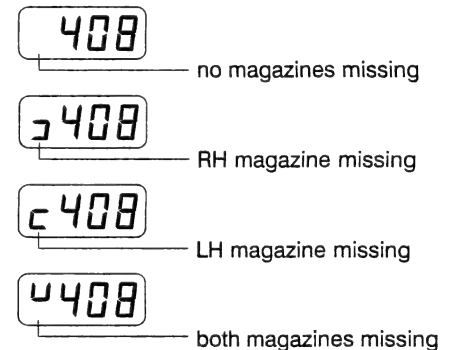


Hint:

To keep the data stored when power is off the plug "Memory" must be set to "ON" position on the SCC unit, otherwise all programmed data in service levels are reset when power is interrupted.

Calling service programs:

Set slide switch "Service" from position OFF to ON, then press the LT button. After an initialization run the display will show the actual jukebox (SCC) program version (e.g.: in the display 4.08) and gives a message whether the magazines are installed properly.



Calling service levels:

By pressing the LT button. The display shows the actual service level number in the LH digit. Each option can be called by pressing the according selection button.

Calling a certain service level (recommended method):

Press selection button R - hold down - and press selection button 0. Release both buttons. The display is dark. Enter the number of the desired service level.

Exit:

Set the slide switch 'SERVICE' to OFF and press the LT button once.

6.2. Programming of the time functions

Level 2

It is necessary to program the time, date and weekday once or at least to control these settings. Only then the jukebox can switch on and off the playstimulator or the Back Ground Music at the desired time. It is useful to program time, date and weekday in a single pass.

How to call service program, level 2:

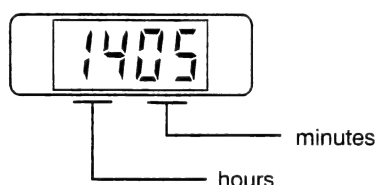
1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 2. Service level 2 is reached.
Display is: 2_ _.

6.2.1. Clock setting

Level 2

Button 0

Press selection button 0 . The display shows the current time e.g.:



If the displayed time is not correct:

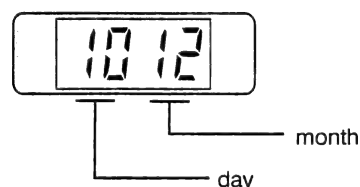
Press selection button 0 -hold down- and press selection button R. Release both buttons. Enter the right time with four digits.

6.2.2. Set date

Level 2

Button 1

Press selection button 1 . The display shows the current date e.g. Dec 10th:



If the displayed date is not correct:

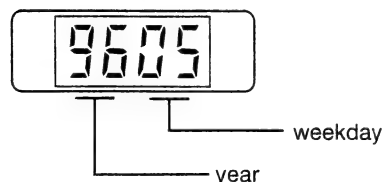
Press selection button 1 -hold down- and press selection button R. Release both buttons. Enter the right date with four digits.

6.2.3. Set year and weekday

Level 2

Button 2

To display the year and the weekday press selection button 2: The display shows e.g.:



The weekdays are assigned to numbers as shown.

0 = Sunday	4 = Thursday
1 = Monday	5 = Friday
2 = Tuesday	6 = Saturday
3 = Wednesday	

To program press selection button 0 -hold down- and press selection button R. Release both buttons. Enter the right year with two digits, then enter a 0 followed by the number of the weekday.

6.3. Programming of the Playstimulator (random selections without coin insertion)

In service level 1 button 5 (ref. to chap. 1.7., page 7) the actual number of CD's in the magazines is registered. If the playstimulator is programmed the jukebox plays random tracks of these CDs. Exemption: CDs declared as BGM CDs (ref. to chapt. 6.4., page 36) will not be used! The time between the last track played by inserted money and the first random track of the playstimulator is programmable from 1 up to 98 min. This time is also the repeat time between two random plays.

The volume is the same as in normal operation. If a selection is made the playstimulator will be interrupted immediately and remains after having played the selected tracks.

The playstimulator only works if Back Ground Music is not active at the same time and if the time is programmed correctly. You can set the jukebox in an easy way to continuous play mode without any additional time programming.

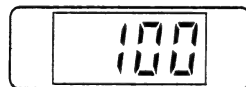
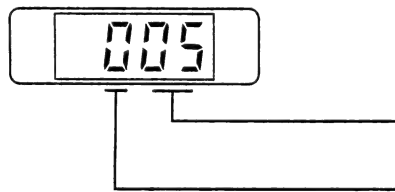
6.3.1. Repeat time programming



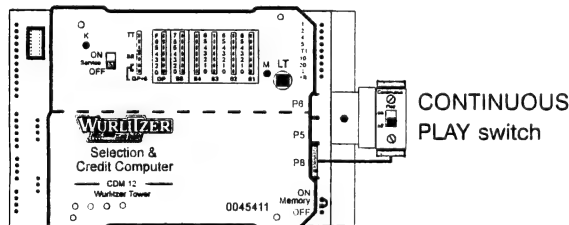
IMPORTANT

Make sure that all time functions programmed correctly. Update if necessary.

Example:



Continuously playing of random tracks.



no random plays



Continuous random plays, however in conjunction with start and stop time.



After a played random track the jukebox waits about 5 minutes before it starts the next one. Random tracks will

only be played in the time between start and stop time. The programming of this 'time window' is described as follows.

Level 2

Button 9

1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 then release both buttons. The display is dark.
4. Press selection button 2. Service level 2 is reached. Display is: 2 _ _ .

Press selection button 9. The display shows three digits.

Repeat time is set to 5 minutes.

This digit enables or disables the CONTINUOUS PLAY MODE, random tracks one after another.

0 = CONTINUOUS PLAY OFF,
1 = CONTINUOUS PLAY ON

Playstimulator operating modes:

- You can set the jukebox in an easy way to CONTINUOUS PLAY MODE by programming the digit CONTINUOUS PLAY to '1'. An additional programming of the clock and the start and stop time is not necessary.
- By means of an optional installed switch you can also switch the box to CONTINUOUS PLAY MODE without any need of entering the service program. Part number of this switch is 0034410. It has to be connected to P8 of the SCC unit.
- A more precise programming in conjunction with the internal clock and the start, stop and repeat time is possible if the digit CONTINUOUS PLAY is set to '0'. A correct programming of all these items is necessary.

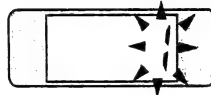
To program press selection button 9 -hold down- and press selection button R. Release both buttons. Now enter the digit for CONTINUOUS PLAY and the REPEAT TIME with three digits.

To check the settings:
Press button 9 again.

6.3.2. Programming start and stop time

Level 2	Button 8
---------	----------

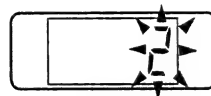
If start and stop time is programmed the jukebox only plays random tracks in this time period.



Press selection button 8. The display shows at first a flashing 1. This means 'start time'.



Then the time will be displayed, here 14.05 o' clock (2.05 p.m.).



Press selection button 8 once again. The display shows now a flashing 2. This means 'stop time'.



Then the time will be displayed, here 18.30 o' clock (6.30 p.m.).

To reprogram press selection button 8 - hold - and press selection button R. Release both buttons. The digital display goes dark. Enter the start and stop time with eight digits.

Example: The jukebox should play random tracks from 09.00 in the morning to 17.00 in the afternoon.

Enter:

0 - 9 - 0 - 0 - 1 - 7 - 0 - 0

stop time

start time



IMPORTANT

You can not program the Playstimulator over 24.00 o'clock (e.g. 23.00 to 2.00 o'clock) !

Then press selection button R.

The display shows 2 _ _ _ .

To check the start time:

Press selection button 8.

To check the stop time:

Press selection button 8 again.

If the Playstimulator does not work:

Check if:

- the clock is set correctly ?
- start and stop time is programmed?
- repeat time is set correctly (not 0)?
- BGM play mode is disabled (ref. to next chapter).
- credits are still in memory.

Example:

5 CD's reserved for BGM

repeat time 10 min.

Exit the serviceprogram:

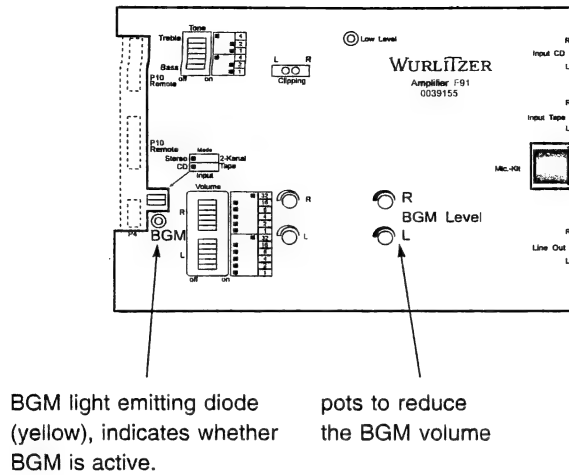
1. Set the slide switch 'SERVICE' at the SCC unit to OFF.
2. Press 'LT' button.

The changer starts an initialisation run. After this the jukebox is ready to operate.

6.4. Back Ground Music

Level 3

Amplifier F91

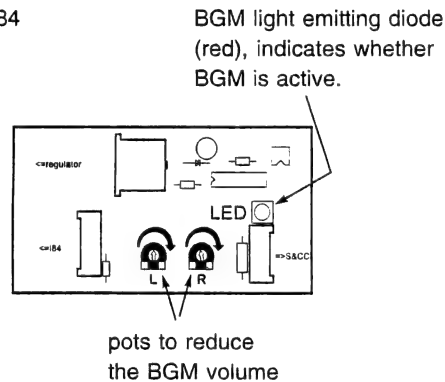


If BGM is programmed and activated a random track from the CDs declared for BGM will be played. The time between the last selected played track and the first BGM track is programmable between 1 and 98 minutes. This time is also the repeat time between two BGM tracks.

The volume by BGM reproduction is reduced compared to the common volume. It is adjustable with the two BGM pots (RH channel / LH channel) on the amplifier (F91) res. with the pots on the BGM level adapter (I84). BGM mode is active when the LED on the amplifier (F91) or on the level adapter lights (I84). The source of the BGM control signal is the SCC unit plug brown (X6), pin 1. Once the BGM mode is activated, then it is not possible to operate the Playstimulator.

If a selection is made by means of coin insertion the track being played will be interrupted immediately. Two intervals can be programmed for each weekday.

Amplifier I84



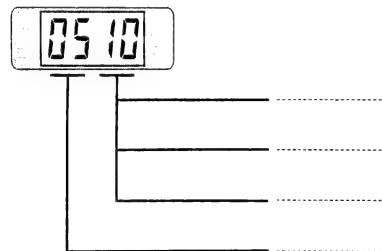
To enable BGM (service program, level 3) :

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 than release both buttons.
4. Press selection button 3. Service level 3 is reached. Display is: 3 _ _ _.

6.4.1. Number of BGM CD's and BGM repeat time

Level 3

Button 7



Example:

5 CD's reserved for BGM
repeat time 10 min.

Press selection button 7 the display shows e.g.:

repeat time between the single BGM tracks (10 min.)

BGM-continuous play = 99

BGM OFF = 00

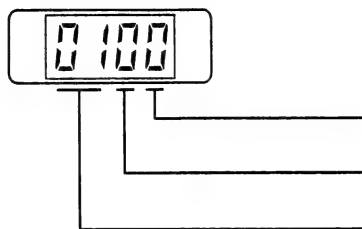
number of BGM CD's; disabled for playstimulator!
(The position of the first BGM CD will be programmed in the next step; ref to sec. 6.4.2)

To program press selection button 7 -hold down- and press selection button R. Release both buttons. The display goes dark. Enter the number of CD's and the repeat time by means of the selection buttons with 8 digits.

6.4.2. Start position for BGM CD's and configuration

Level 3

Button 8



Press button 8. The start position of the BGM CDs is displayed in the left two digits. The RH digit indicates the actual BGM mode.

BGM mode

not used, always 0

start position of BGM CD's

You can determine the digit for the BGM mode as follows:

BGM mode	selection
You want to select BGM CDs by coin insertion too:	yes -> 0; no -> 1
You want that the jukebox plays BGM-CDs also if credit still exists:	yes -> 2; no -> 0
BGM start position over 100:	yes -> 4; no -> 0

Select the desired features and add the according code numbers. Enter the sum of the code numbers as the mode digit.

Example:

BGM-CD's not selectable by coininsertion . . . = 1

BGM-CD's should not be played at still existing credits = 0

BGM start position over 100 = 4

Mode number = 5

To **program** press selection button 8 - hold - and press selection button R. The digital display goes dark. Enter start position followed by a '0' and the BGM mode digit with 4 digits!

**IMPORTANT**

If a wall box is connected the BGM selection option must be set to 0 (yes).

After entering this data the SCC unit calculates the BGM end position itself. For loading of BGM discs the end position can be calculated as follows:

end position = start position + number of BGM-CDs - 1.

6.4.3.BGM time zones at different weekdays

Level 3 Buttons 0-6

You can program each weekday differently with two intervals per day. The following steps are the same for the buttons 1 to 6 in service level 3 according the table for weekdays.

1. Press button 0, the display shows flashing:



0 (LH) = Sunday
1 means start time one

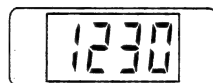


then the time will be displayed, here 9.00 o'clock

2. Press selection button 0 again, the display shows flashing:



0 (LH) = Sunday
2 means stop time one



then the time will be displayed, here 12.30 o'clock

3. Press selection button 0 again, the display shows flashing:



0 (LH) = Sunday
3 means start time two



then the time will be displayed, here 20.00 o'clock

4. Press selection button 0 again, the display shows flashing:



0 (LH) = Sunday
4 means stop time two



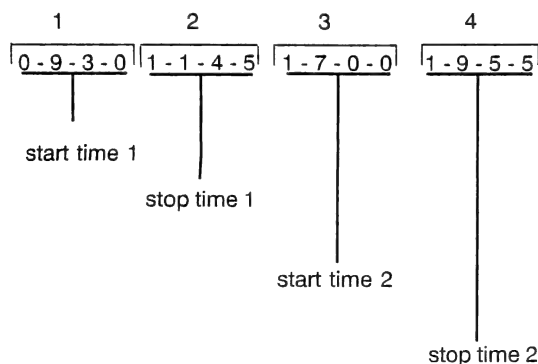
then the time will be displayed, here 23.45 o'clock

Table of weekdays:

0 = Sunday	4 = Thursday
1 = Monday	5 = Friday
2 = Tuesday	6 = Saturday
3 = Wednesday	

To program press selection button 0 (or button 1 - 6 depending on the weekday to be programmed). The digital display goes dark. Enter the two time zones in four blocks containing four digits per block one after another (16 digits).

Meaning of the digits to be entered in the example.



Examples:

The jukebox should play BGM on Tuesday from 9.30 to 11.45 and from 17.00 to 19.55. To program press selection button 2 - hold - and press selection button R. The digital display goes dark. Then enter 0-9-3-0-1-1-4-5-1-7-0-0-1-9-5-5.

If the jukebox should play BGM on Wednesday from 17.00 to 19.55 only, then program on selection button 3 as described: 1-7-0-0-1-9-5-5-0-0-0-0-0-0-0-0. The second time zone has to be filled with zeros. Also this programming is possible:

0-0-0-0-0-0-0-0-1-7-0-0-1-9-5-5.

Repeat this procedure until all weekdays are programmed (selection buttons 0 to 6).

6.5. Happy hour pricing (additional bonus plays)

During the 'Happy hour' time additional bonus plays can be given. Happy hour time zone and number of additional bonus plays have to be programmed before.

6.5.1. Programming of the happy hour start and stop time

Level 2	Button 6
---------	----------

1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 than release both buttons. The display is dark.
4. Press selection button 2. Service level 2 is reached. Display is: 2 _ _ .

5. Press selection button 6. The display shows flashing:



1 means start time



then the start time will be displayed with four digits e.g.: 9.00 o' clock

6. Press selection button 6 again. The display shows flashing:



2 means stop time

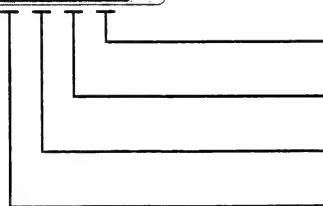


then the stop time will be displayed with four digits e.g.: 12.30 o' clock

7. To reprogram press selection button 6 - hold - and press selection button R. The digital display goes dark. Enter the 'Happy hour' start and stop time with 8 digits. After complete entry the digital display is dark. Example: "Happy Hour" should operate from 09.05 to 11.00 o'clock. Enter 8 figures: 0 - 9 - 0 - 5 - 1 - 1 - 0 - 0 .
8. To check the settings: Repeat the steps 5 and 6 .

6.5.2. Programming of the additional bonus plays

Level 2	Button 7
---------	----------



1. Press selection button 7. The display shows e.g.:

- 7 additional plays at bonus level 1 (B1).
- 5 additional plays at bonus level 2 (B2).
- 3 additional plays at bonus level 3 (B3).
- 1 additional play at bonus level 4 (B4).

2. To reprogram press selection button 7 - hold - and press selection button R. The digital display goes dark. Enter the new happy hour pricing with 4 digits.
3. To check the new setting, press selection button 7 again.
4. To exit the service program set the slide switch 'SERVICE' to OFF and press button LT on the SCC unit.

6.6. Number of tracks played successively on the same disc

Level 2

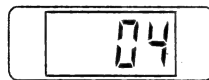
Button 3

The display shows the maximum number of tracks played successively from the same disc if more tracks had been selected. Preset value = 04 tracks, i.e. after four tracks from this CD it will be taken back to the magazine, and the next CD stored in the selection memory will be played.

If selections still exist for the previous CD they will be played later. This option to limit the tracks played from one CD is more useful for operators. For individual use this value can be set up to 99.

To call the service program (level 2):

1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 than release both buttons. The display is dark.
4. Press selection button 2. Service level 2 is reached. Display is: 2 _ _ _.
5. Press selection button 3 the display shows e.g.:



04 is factory pre setting for number of tracks played successively on the same disc.

6. To program press selection button 3 - hold - and press selection button R. The digital display goes dark. Enter the desired setting by means of the selection buttons with two digits.

If you set this value to 01 all selections will be played in selection order.

7. To check the settings: Press selection button 3 again.
8. To **exit the service program** set the slide switch 'SERVICE' at the SCC unit to OFF and press the 'LT' button once. The changer starts an initialisation run. After this the jukebox is ready to operate.

6.7. Selective disabling of tracks

Level 2

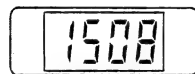
Button 4

You can disable up to maximum 25 different tracks of different CD's. If somebody selects a disabled track the digital display flashes. This shows that this track is not selectable. Note a special peculiarity at playstimulator or BGM operation. The random procedure always selects tracks out of a number of 25. If the random selected

track exceeds the number of tracks on the CD the procedure starts to count from the beginning of the CD. Result is, if you want to disable e.g. track 8 on a CD with 17 tracks you also have to disable track 23 on this disc even if it does not really exist.

To disable tracks (service program level 2):

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 than release both buttons.
4. Press selection button 2. Service level 2 is reached. Display is: 2 _ _ _.
5. Press selection button 4 the display shows e.g.:



track number

CD number

Each operation of selection button 4 indicates the next disabled track, maximum 25 tracks.

After having reached the last disabled track, the first one is indicated again. If the display shows 0000 after the first button operation no track is disabled.

6. To program: Press selection button 4 - hold - and press selection button R. The digital display goes dark.
7. Enter at first the number of the CD to disable followed by the track (total four digits).
8. To disable the next CD/track, press selection button 4 as often as display shows 0 0 0 0 .
9. Press selection button 4 again - hold - and press selection button R. The digital display goes dark. Then enter CD and track to disable. Continue programming for the next track with step 8.
10. To check the disabled tracks: Press selection button 4 again (up to 25 times, at 25 disabled tracks).
11. To **exit the service program** set the slide switch 'SERVICE' at the SCC unit to OFF and press the LT button.

To enable a disabled track:

When a track is indicated, press button 4 - hold - and press selection button R and enter first the number of the CD followed by 0 0.

To enable all disabled tracks:

Press selection button 4 -hold down- and press selection button R. Then enter 0 0 0 0 (4 times 0).

6.8. Location or Identification number

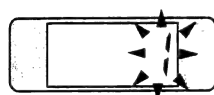
Level 1	Button 8
---------	----------

A location or identification number of 8 figures can be programmed as a customer or individual machine number.

To enter the number (Service program, level 1):

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 1. Service level 1 is reached.
Display is: 1_ _ _.

5. Press selection button 8, the display shows flashing:

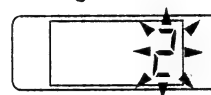


1 means higher digits

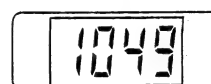


Then the four higher digits will be displayed with 4 figures.

6. Press selection button 8 again, the display shows flashing:



2 means lower digits



Then the four lower digits will be displayed with 4 figures.

In this case the Id number is 8 5431 049.

7. To reprogram press selection button 8 - hold - and press selection button R. The digital display goes dark. Then enter the complete number with 8 digits.
8. To check the settings: Press selection button 8 again.
9. To **exit the service program** set the slide switch 'SERVICE' at the SCC unit to OFF and press the LT button.

6.9. Album selection and memory reset by power off

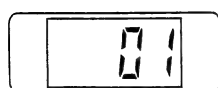
Level 1	Button 9
---------	----------

By setting the corresponding digit to 0 or 1 these options are available.

Album selection is possible by entering the disc number followed by 0 0 (track 0 0). All tracks on the CD are played, starting with the first track. An album is only selectable by coin insertion, if credits of the 4th bonus level have been obtained or in free play modus (link in row GP from 0 to F on the SCC unit) of the jukebox.

To alter the settings (Service program, level 1):

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 1. Service level 1 is reached.
Display is: 1_ _ _.
5. Press selection button 9, the display shows e.g.:



digit for albumplay; 1 = ON, 0 = OFF

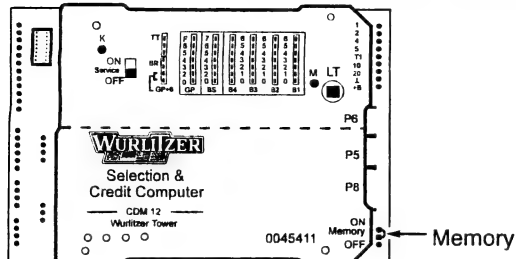
digit for memory reset by power off; 1 = ON, 0 = OFF

Memory reset feature will cancel remaining credits and selections by power off of the jukebox.

This option prevents the jukebox playing pre-selected tracks from the day before. (The jukebox was switched off in the night, not playing all the selected tracks.)

6. To alter the settings press selection button 9 - hold - and press selection button R. The digital display goes dark. Then enter the desired setting with two figures.
7. To check the settings: Press selection button 9 again.
8. To **exit the service program** set the slide switch 'SERVICE' at the SCC unit to OFF and press the LT button.

7. Data retrieval



The data retrieval memory keeps only data if the plug 'MEMORY' is always in the position ON (on the RH. side of the SCC unit).

7.1. Operator data

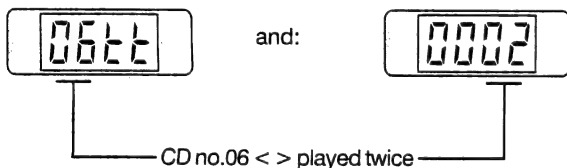
You can retrieve the statistical data for operators in the service program level 1 over the display or with a printer.

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 1. Service level 1 is reached.
Display is: 1 _ _ _.

7.1.1.Retrieval of least popular discs (flops)

Level 1	Button 0
---------	----------

1. Press selection button 0 once.
At first the least played CD is shown. The last two digits are simply a code confirming the least played status. The display counter flashed alternately the disc number and then the number of plays e.g.:



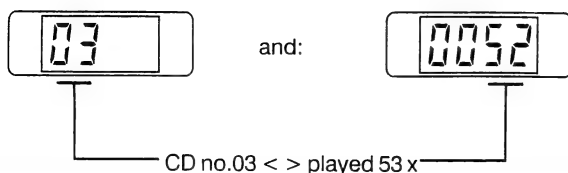
If the counter shows 0 0 0 0, this means the disc had not been played. Press selection button 0 to continue the process for the second least played disc, and so on. At first the CD with the lowest number of plays will be displayed, with the next operation of selection button 0 the CD with the second lowest number of plays etc. If the calculation needs a little longer a '1' scrolls starting from RH. digit over the display.

2. To cancel the procedure press selection button R.

7.1.2.Top Tunes

Level 1	Button 1
---------	----------

1. Press selection button 1 once.
The display counter flashes alternately the number of the most played CD and then the number of plays.
For example:



Only 63 selections per CD can be stored in memory. So if a CD have been played more than 60 times all the other values will be decreased by 1. Then the displayed values are only relative.

Press selection button 1 to continue the process for the second most played CD, and so on.

The most frequently played track will also be displayed as HIT OF THE HOUSE in common operation.

7.1.3.Cash box contents

Level 1	Button 2
---------	----------

1. Press selection button 2 once. Digital display shows the cash box contents in basic units; basic units being the value of the lowest coin value.
2. To cancel the procedure press selection button R.

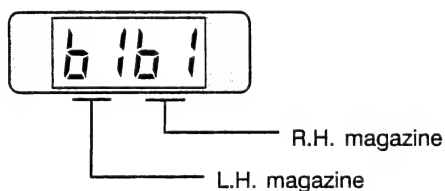
7.1.4.Total number of plays

Level 1	Button 3
---------	----------

1. Press selection button 3 once. Display shows the total number of plays since last reset (maximum 9999).
2. To cancel the procedure press selection button R.

7.1.5.CLEAR ALL counters (reset to 0 0 0 0)

Level 1	Button 3 + Reset
---------	------------------



1. Press selection button 3 - hold - and press selection button R (reset).
The counters belonging to the buttons 0 to 3 (least popular disc, most popular disc, cash box and total plays) are cleared and reset to 0 0 0 0.

After leaving the service program the jukebox initializes itself, during this procedure the compartments in the magazines will be counted. At the end of the initialization the display should show 6161 for a short time. If lower numbers are displayed not all compartments have been detected correctly. The sequence of top discs is for the time being 01, 02, 03, 04 etc.

2. To exit the service program first set service switch to OFF and then press the LT button.

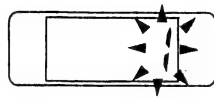
7.1.6.Memory of not playable CDs

Level 1	Button 6
---------	----------

Careful handling of the CDs does not completely exclude that CDs may be damaged in different ways. Possibly the player would interrupt this CD at each selection. The SCC provides a watch dog function which finds and memorizes these difficult to play.

The SCC unit can store the numbers of up to six not playable CDs. Once a CD is registered every new try will be counted. So it is possible to find out bad discs and change these for new ones.

1. Press selection button 6, the display shows flashing:



1 means first defective CD

than e.g.:



NUMBER of times the
CD was not playable or
interrupted

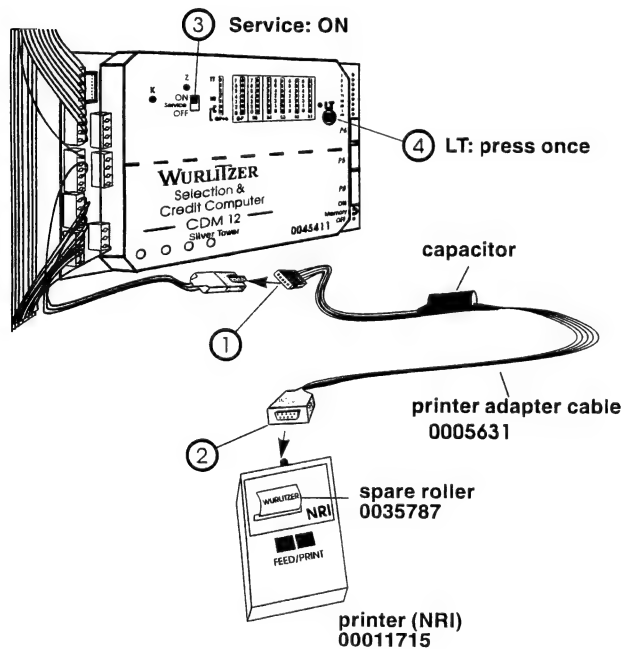
CD number

2. Press selection button 6 to display the next not playable CD, etc. After displaying the 6th not playable CD and pressing selection button six the display starts with the first one again.
3. To CLEAR this memory press selection button 6 - hold - and press selection button R.
4. To exit the service program, first set service switch to OFF and then press LT button.

7.1.7.Statistic print-outs

Level 1	Button 2 + Reset
---------	------------------

For data retrieval a printer can be connected to a receptacle located in a wire loom underneath the SCC unit:



1. Connect printer adapter cable (Part No. 0005631) with receptacle underneath the SCC unit.
2. Connect printer (part no. 0011715) with the printer adapter cable.
3. Enter the service program by setting the service switch to ON position.
4. Press LT button on the SCC unit. Display may show i.e.: _408 = SCC program version, may be higher too
5. Press selection button R -hold down- and press selection button 0. The display is dark.
6. To reach service level 1, press selection button 1. Display shows 1 _ _ _.
7. Press selection button 2 - hold - and press button R, the print-out starts.

The following information will be reported:

=====	
WURLITZER	
COMPACT-DISK	
JUKE-BOX	
S+C-COMPUTER	
=====	
PREV. DATE:	Date and time of the previous print out
22.04.96	
09:11	
ACTUAL DATE:	Date and time of current print out
29.05.96	
09:43	
PRINT: 0001	No. of print out
IDENT:	
00000000	Identification number (service level 1, selection button 8)
--SETTINGS--	
=====	
CDBOX: 04.08	Program version number
BOX TYPE:120	max. number of CD's in magazines
BONUS-1 : +1	
BONUS-2 : +1	Jumper setting
BONUS-3 : +1	on the SCC unit
BONUS-4 : +2	
BONUS-STEP:5	row BS
CREDITSTEP:2	row GP
BONUS- RESET	jumper BR
DISCS : 86	Programmed number of CDs in carrier (service level 1, selection button 5)
MINUTES : 01	Programmed repeat time for playstimulator.
-STATISTICS-	
=====	
CASH : 0401	Total income in basic units since last reset..
PLAYS: 0132	Total plays since last Reset.
TOTAL:000401	Total income, not resetable.
CHECK: 2272	Safety number.
-TOP-DISKS--	
=====	
CD :01 =0017	
CD :12 =0008	Shows all discs in carrier (max.100);
CD :30 =0007	and the number of plays.
CD :10 =0006	Top disc is shown at first, least popular disc or
CD :20 =0005	non-played discs are shown at last.
CD :00 =0000	
:	
CD :50 =0000	
:	
CD :99 =0000	

To leave the service program, first set service switch to OFF and then press LT.

7.2. Service data

Level 4	Button 8
---------	----------

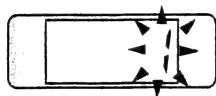
Special data for the jukebox service are displayed in service level 4 button 8. By pressing the button 8 several times you can call up the contents of up to 18 different storage locations stored in the below explained statistical values. This data is useful to assess the condition of the jukebox and its mechanism.

1. Set the slide switch 'SERVICE' at the SCC-unit to ON.
2. Press 'LT' button.
3. Press selection button R -hold down- and press selection button 0 then release both buttons.
4. Press selection button 4. Service level 4 is reached. Display is: 4_ _ _.

7.2.1.Retrieval of the last occurred mechanism faults

The SCC unit stores up to 9 of the last occurred mechanism error codes (procedure step codes) If more errors occur the eldest codes will be deleted.

1. Press selection button 8, display shows flashing:



1 = 1st error code

then e.g.:



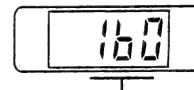
1st error code is always 000 (memory check).

2. Press selection button 8 again, display shows flashing:



2 = last occurred error code

then e.g.:



Error 160: Error when reaching the vertical take out position.

3. Press selection button 8 once more to display the next error code etc. After displaying the 10th code, special values will be displayed (ref to the following chapters).
4. DELETE this data: Press selection button 8 - hold - and press button R.
5. Exit: Press button R.

Procedure step codes for 'CD to turntable':

in rest	in action	meaning
32	160	selection sledge reaches the vertical 'take out position'
33	161	open gripper (before taking a CD)
34	162	move gripper into magazine
35	163	close gripper (get a CD)
36	164	get a CD from magazine an move to the vertical transport level (LH or RH side).
37	165	reach the CD player - move sledge to player unit.
38	166	move gripper to the horizontal player position.
39	167	move sledge with CD to the player.
40	168	open gripper (release CD)
41	169	move gripper out of player range.
42	170	fix the CD with the pressure disc.
43		CD on player, end of procedure.

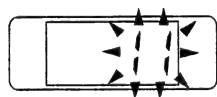
Procedure step codes for 'CD to magazine':

in rest	in action	meaning
16	144	get vertical sledge position over the player
17	145	move gripper horizontal to take the CD.
18	146	close gripper.
19	147	lift CD.
20	148	move to vertical transport level.
21	149	move sledge to magazine return position.
22	150	move gripper with CD into magazine.
23	151	open gripper.
24	152	move gripper out of magazine.
25	153	move sledge to 0-position.
26		CD is taken back, end of procedure.

7.2.2. Counter for complete mechanism cycles

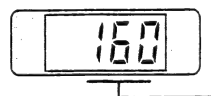
After the end of each replacing procedure the counter will be incremented. This information given in the steps 11 and 12 of service level 4 button 8 will be displayed with 8 figures. Because of a only four digit display, this value will be displayed in two parts the 4 higher and the 4 lower digits. To display the complete value:

1. Press selection button 8 as often as, display shows flashing:



11 = next displayed value is the high part of the mechanism counter

then e.g.:



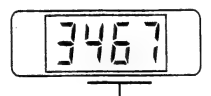
value, means 1 600 000

2. Press selection button 8 again, display shows flashing:



12 = next displayed value is the low part of the mechanism counter

then e.g.:



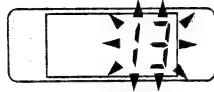
value, means 3 467

In this example the machine has placed and replaced the CD's 1603467 times.

7.2.3. Counter for total number of mechanism faults

Each mechanism error will be counted. This information given in the steps 13 and 14 of service level 4 button 8 will be displayed with 8 figures too. To display the complete value:

1. Press selection button 8 as often as, display shows flashing:



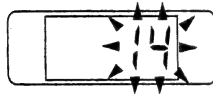
13 = next displayed value is the high part of the error counter

then e.g.:



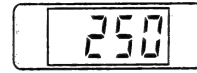
value

2. Press selection button 8 again, display shows flashing:



14 = next displayed value is the low part of the error counter

then e.g.:



value

In this example 250 errors have occurred.

7.2.4. Counter for total number of power up's

Each power up will be counted. This information given in the steps 15 and 16 of service level 4 button 8 will be displayed with 8 figures too. To display the complete value:

1. Press selection button 8 as often as, display shows flashing:



15 = next displayed value is the high part of the power up counter

then e.g.:



value

2. Press selection button 8 again, display shows flashing:



16 = next displayed value is the low part of the power up counter

then e.g.:



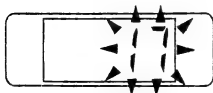
value

In this example the power was switched on 10023 times.

7.2.5. Counter for total operating time

The operating time displayed in the steps 17 and 18 of service level 4 button 8 will be displayed in minutes with 8 figures too. To retrieve the complete value:

1. Press selection button 8 as often as, display shows flashing:



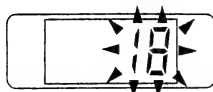
17 = next displayed value is the high part of the operating time counter

then e.g.:



value

2. Press selection button 8 again, display shows flashing:



18 = next displayed value is the low part of the operating time counter

then e.g.:



value

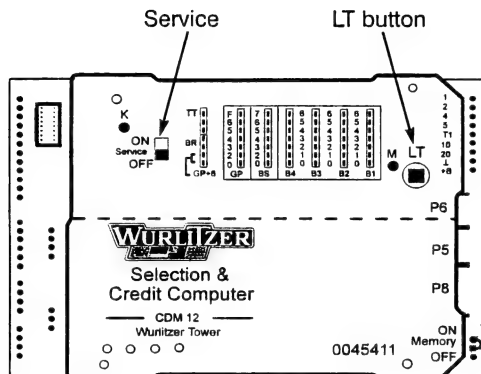
In this example the total operating time is 241453 minutes. (approx. 4024 h).

8. Function tests

The function tests are divided in 3 groups. Display test (level 1), mechanism tests (level 4) and player tests (level 5).

8.1. Digital display test / EPROM-version

Level 1	Button 4
---------	----------



1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 than release both buttons. The display is dark.
4. Press selection button 1. Service level 1 is reached. Display is: 1 _ _ _.
5. Press selection button 4. All segments counting 0 to 9 are displayed, then the program version number (EPROM version).
6. To cancel the procedure press selection button R.

8.2. Mechanism single step tests

Service level 4 includes all functions to check the CD-2 mechanism. Single step and continuous tests can be made.

1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 than release both buttons. The display is dark.
4. Press selection button 4. Service level 4 is reached. Display is: 4 _ _ _.

8.2.1. Take CD to turntable

Level 4	Button 0
---------	----------

1. Press selection button 0 and enter the desired CD number.
This function is not supported from program versions up to 4.08!

8.2.2. Step selection sledge upwards

Level 4	Button 2
---------	----------

1. Press selection button 2. The button has an auto repeat function.

Each button operation makes the sledge move one step upwards and the display will be increased by 2. Last position is 120.

If both magazines exist, the left one will be used as reference. If the L.H. magazine is missing the other one is used.

8.2.3. Step selection sledge downwards

Level 4	Button 1
---------	----------

1. Press selection button 1. This button has an auto repeat function.

Display shows _ _ 0 0:

If the display is still 0 0, the selection sledge (german: AusWahlSchlitten - AWS) is located in its lowest position (basic position). So it is impossible to move it further down. It can only be moved if the sledge had been moved up with selection button 2 before. Then the display will also show a greater number as 0 0, e.g.: 22.

Display shows a number greater than 0 0, e.g.: _ _ 2 4

Each button operation makes the sledge move one step downwards and the display will be decreased by 2. Last position is 02.

8.2.4. Get a CD from LH magazine

Level 4	Button 3
---------	----------

**CAUTION**

After having taken the CD to the turntable the SCC automatically jumps to service level 5! You only can jump back to SL 4 by pressing the button 3 to run the procedure 'STOP and back to SL 4'.

1. Press selection button 3. A CD is taken from the actual sledge position and placed to the turntable. The service program automatically jumps to service level 5.

8.2.5. Get a CD from RH magazine

Level 4	Button 4
---------	----------

**CAUTION**

After having taken the CD to the turntable the SCC automatically jumps to service level 5! You only can jump back to SL 4 by pressing the button 3 to run the procedure 'STOP and back to SL 4'.

1. Press selection button 4. A CD is taken from the actual sledge position and placed to the turntable. The service program automatically jumps to service level 5.

8.3. Mechanism continuous tests

Level 4	Button 9
---------	----------

To locate certain faults occurring only from time to time it may be helpful to run continuous tests. During the tests described below, the display shows special procedure step codes. These codes are divided in rest and action codes (ref. to the table opposite).

If the machine stops at a certain point in conjunction with these codes you can determine the point of fault. In this case you should switch off the jukebox and try to find

the reasons of this fault. Then you have to take the selection sledge in its home position by hand. Home position means: The position of the magnetic pressure disc is approx. 1 cm (1/2 ") over the player and the gripper motor stays on the RH side of the pressure disc holder. The LH edge of the gripper holder should align with the RH edge of the pressure disc holder. Then switch on the jukebox it initializes itself.

Test start:

1. Press selection button 9 -hold- and press button R. Release all buttons
2. **Press selection buttons 1 ,2 ,3 or 4, according the table 'continuous test procedures'.**
The continuous test starts.

Test stop:

Press selection button 9.

All continuous tests can be switched to single step mode while running:

Single step - ON: Press selection button 5.

The just running step runs to its end. The machine waits.

Single step - NEXT: Press selection button 5 again. Only the next one step runs. Press button 5 again etc.

Single step - OFF: Press selection button 6.

Continuous test procedures

Selection button 1	CD change test Remove all CD's and insert only the CD's no. 119 and 120!	The gripper takes the CD from compartment 119, takes it to the turntable and back to compartment 099! Now the gripper takes this CD to the turntable and back to compartment 079 e.t.c.. At the end the gripper takes the CD back to comp. 119. The the same procedure starts on the RH side with CD 120. If an error occurs the machine will stop displaying the corresponding error code.
Selection button 2	gripper test	The gripper opens and closes continuously.
Selection button 3	takes the CD no. 30 to and from turntable	
Selection button 4	takes the CD no. 29 to and from turntable	

Procedure step codes

in rest	in action	meanig	
16 17 18 19 20 21 22 23 24 25 26	144 145 146 147 148 149 150 151 152 153	get vertical sledge position over the player move gripper horizontal to take the CD. close gripper. lift CD. move to vertical transport level. move sledge to magazine return position. move gripper with CD into magazine. open gripper. move gripper out of magazine. move sledge to 0-position. CD is taken back, end of procedure.	CD back to compartment
32 33 34 35 36 37 38 39 40 41 42 43	160 161 162 163 164 165 166 167 168 169 170	selection sledge reaches the vertical 'take out position' open gripper (before taking a CD) move gripper into magazine close gripper (get a CD) get a CD from magazine an move to the vertical transport level (LH or RH side). reach the CD player - move sledge to player unit. move gripper to the horizontal player position. move sledge with CD to the player. open gripper (release CD) move gripper out of player range. fix the CD with the pressure disc. CD on player, end of procedure.	'CD to turntable'
48 49 50	176 177 178	attempt to move the selection sledge to the player initialize the magazines (count to 6161). move the sledge to the player, after initialization.	to initialize
80 81	208 209	close gripper open gripper	gripper
	112 126 254	check sum error in memory for CD2 mechanism (e.g. after 'battery off operation') error while error was handled total error, e.g. defective RAM or CPU...	errors

8.4. Light gate tests

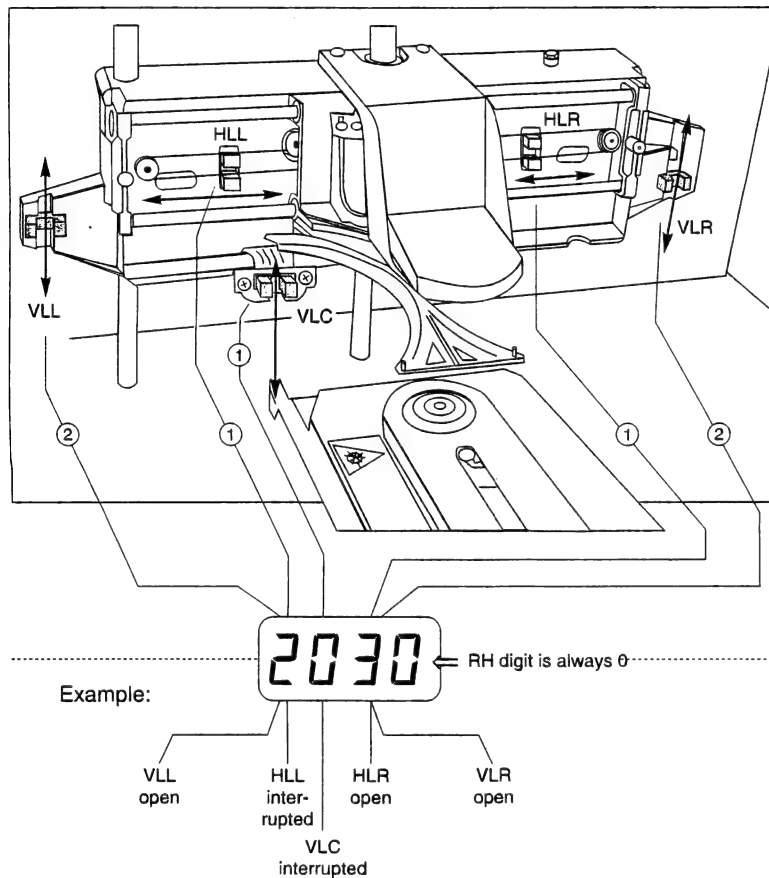
Five light gates are used to position the selection sledge. These sensors scan certain rulers. The name of a light gate corresponds to the principal ruler (in German: Lineal).

1. Vertical-Lineal-Left (VLL), vertical ruler LH side
2. Horizontal-Lineal-Left (HLL), horizontal ruler LH side
3. Vertical-Lineal-Centre (VLC), vertical ruler centre
4. Horizontal-Lineal-Right (HLR), horizontal ruler RH side
5. Vertical-Lineal-Right (VLR), vertical ruler RH side

8.4.1. Light gate snapshot

Level 4	Button 7
---------	----------

To start the test: Press selection button 7.



- By pressing selection button 7 a 'snapshot' of the actual gate state will be made. Then this state will be displayed in a coded form.
- An interrupted gate sends a '0' to the principal digit in the display.
- Two gates are combined in the second and fourth digit (from RH side) of the display.
- Both left and right gates (VLL, VLR) send a '2' if open to the corresponding digit, the others a '1'. This value adds itself.
- The RH digit is always 0.

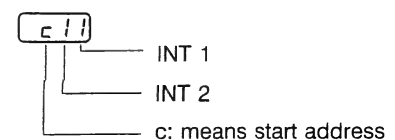
To exit the test: Press selection button R.

8.4.2. Light gate function test

Level 4	Button 9
---------	----------

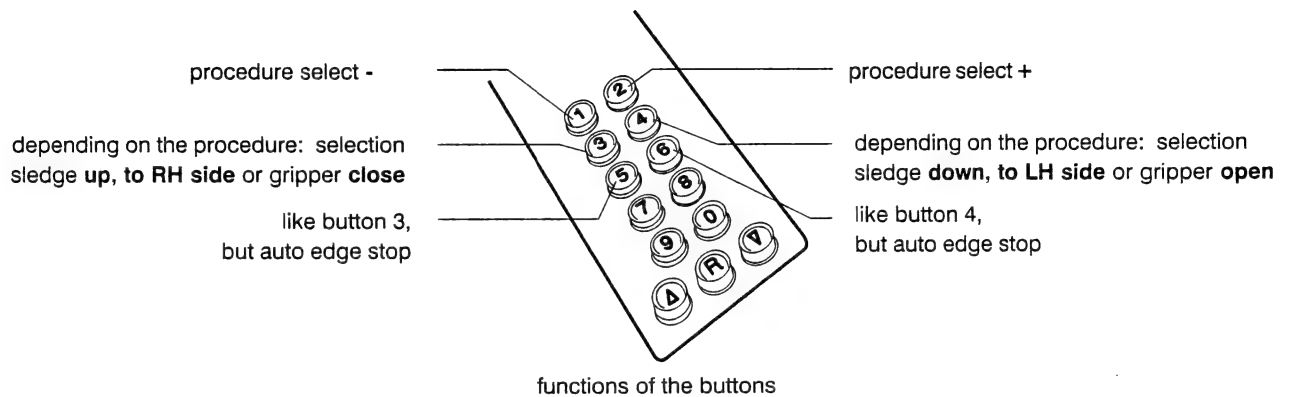
With this test you can check each single light gate by a continuous test loop during operation. A "0" in the display represents an open gate, a "1" represents a closed one. The gate to be checked is connected by software to the interrupt request line INT1 which is used in normal operation. INT1 is always shown in the most RH digit of the display. So do not worry that the left ruler VLL is displayed in the second digit from right.

Test start: Go to service level 4 press selection button 9 - hold - and press selection button R Release both buttons and press selection button 9 again. The display shows

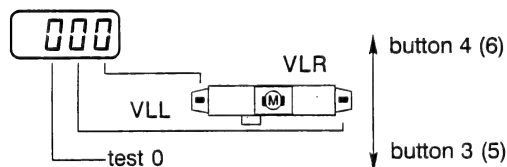


Now you can select different test procedures. Each procedure checks a certain function and the corresponding light gate. The procedures are numbered from 0 to 9 and can be selected with the selection buttons 1 (counts downwards) and 2 (counts upwards). The procedures 7, 8 and 9 have no function.

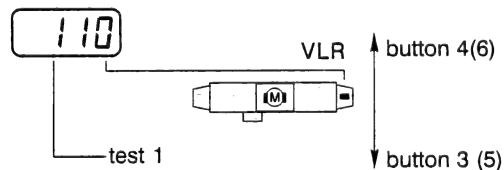
Depending on the selected test you can carry out special actions by means of the selection buttons 3 and 4. If you use the selection buttons 5 or 6 each action will be stopped at an occurring bright dark or dark bright change (auto edge stop) of the gate.



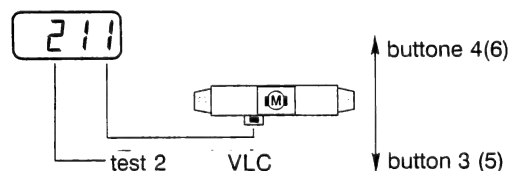
Meaning of the tests:



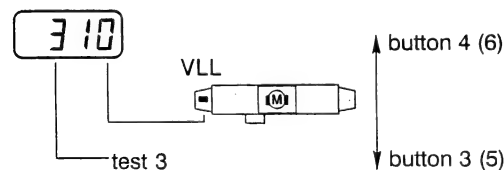
- 0 Test: VLL & VLR together. **VLL** is displayed in the **RH** digit (INT1), VLR in the second digit from RH (INT2). 1=gate is interrupted, 0=gate is open. Button 3 (5) makes the selection sledge move downwards, button 4 (6) upwards.



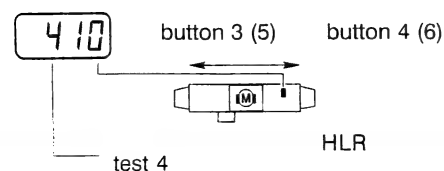
- 1 Test: VLR. State is displayed in the RH digit (INT1). 1=gate is interrupted, 0=gate is open. Button 3 (5) makes the selection sledge move downwards, button 4 (6) upwards.



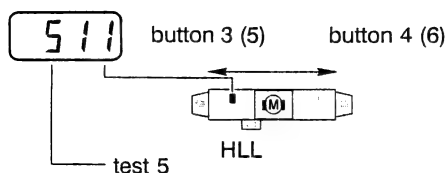
- 2 Test: VLC (Centre). State is displayed in the RH digit (INT1). 1=gate is interrupted, 0=gate is open. Button 3 (5) makes the selection sledge move downwards, button 4 (6) upwards.



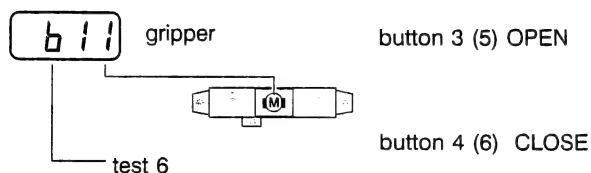
- 3 Test: VLL. State is displayed in the RH digit (INT1). 1=gate is interrupted, 0=gate is open. Button 3 (5) makes the selection sledge move downwards, button 4 (6) upwards.



- 4 Test: VLL. State is displayed in the RH digit (INT1). 1=gate is interrupted, 0=gate is open. Button 3 (5) makes the gripper move to the LH side, button 4 (6) to the RH side.



- 5 Test: HLL . State is displayed in the RH digit (INT1).
1=gate is interrupted, 0=gate is open. Button 3 (5) makes the gripper move to the LH side, button 4 (6) to the RH side.



- 6 Test: Gripper. State is displayed in the RH digit (INT1).
1=gate is interrupted, 0=gate is open. Button 3 (5) opens the gripper, button 4 (6) closes it.

8.5. CDM12 function tests

Level 5

The following tests can be done in service level 5. In some cases level 5 is reached automatically (ref. to chap.8.2.4, 8.2.5., page 48), because these tests are parts of complete test procedures.

1. Set the slide switch 'SERVICE' at the SCC unit to ON.
2. Press 'LT' button. Display shows e.g.: _ 4 0 8 (408 or higher = SCC program version)
3. Press selection button R -hold down- and press selection button 0 than release both buttons. The display is dark.
4. Press selection button 5. Service level 5 is reached. Display is: 5 _ _ _.

8.5.1.CD player check (START)

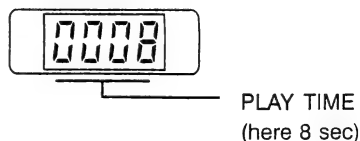
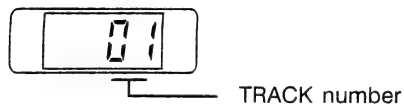
Level 5

Button 6

Before starting this test a CD has to be placed on the turntable (ref to chap. 8.2.4.). If no track had been selected with the buttons 0 or 9 the complete CD will be played.

1. Press selection button 6, the CD will start to play beginning with the first track. The display shows at first:

then the current play time in sec.:



CAUTION

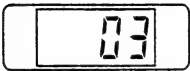
The displaying of the play time in this test is an important indicator for the serial communication between the SCC unit and the CD controller!

8.5.2.NEXT

Level 5	Button 0
---------	----------

Service level 5 has to be reached and a CD has to be placed on turntable (ref. to chap. 8.2.4 page 50).

1. Press selection button 0 (several times). The CD starts and the track number according to the number of key actuation will be played. Only this track will be played. The digital display shows at first e.g.:



TRACK number

then the current play time in sec (e.g. 8 sec).



PLAYTIME of actual track

If selection button 0 is pressed again once the next track will be played or
if selection button 6 is pressed the remaining tracks of the CD will be played.

8.5.3. PREVIOUS

Level 5	Button 9
---------	----------

Service level 5 has to be reached and a CD has to be placed on turntable (ref. to chap. 8.2.4 page 50).

1. Press selection button 9 (several times too).
The player jumps to the previous track with each button actuation.
If track 1 is reached it will be played continuously.
If button 6 is pressed in between, the remaining tracks of the CD will be played.

8.5.4.STOP

Level 5	Button 5
---------	----------

1. Press selection button 5.
CD stops playing. Display shows 5 _ _ _ (service level5).

8.5.5.STOP playing and go back to level 4

Level 5	Button 3
---------	----------

1. Press selection button 3.
CD stops playing. Display shows 4 _ _ _ (service level 4).

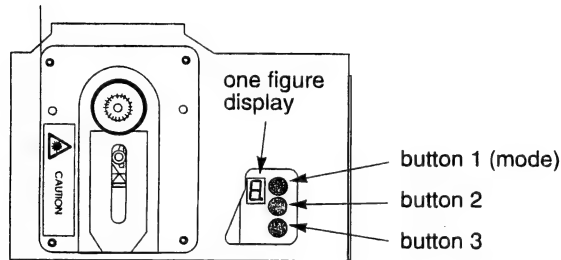
✓

IMPORTANT

To terminate all the tests to return to normal operation: Set slide switch 'SERVICE' on the SCC unit to OFF. Press 'LT' button also on the SCC unit.

9. Integrated test program of the CDM12 player

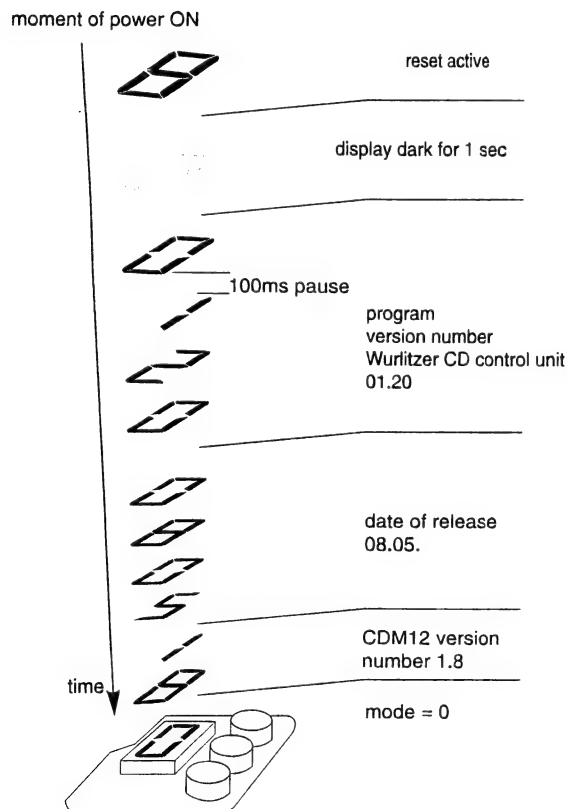
9.1. Access to the player functions without S&CC unit



For a test the complete player unit CDM12 can be operated without S&CC unit.

The power supply from the installed amplifier, the sub-transformer and an amplifier with CD input for the audio signal is required.

A one digit digital display indicates the current operation mode and three command buttons are located on the player chassis.

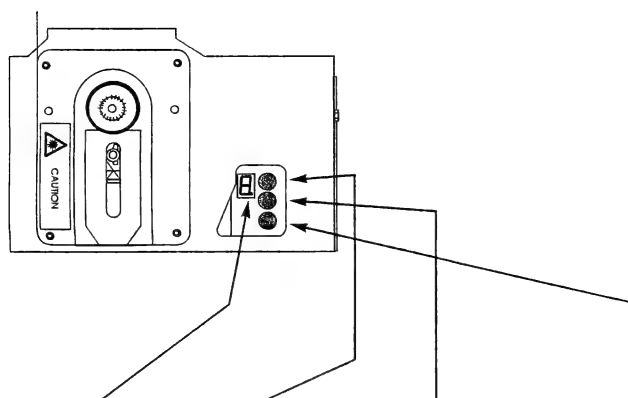


The one digit display is able to display more information.

To display two or more digits the information starts with a dark phase of approx. 1 sec. followed by the digits shown one after another with dark phase of 100 msec. between each digit. The most significant digit will be displayed at first.

After power on and after a general reset command (display shows "8"), the program version number of the Wurlitzer CD control unit will be displayed with four digits followed by the version number of the CDM12 servo processor with two digits.

If the player is in stand by and the three buttons on the player are pressed at the same time the above mentioned sequence will be displayed but without showing "8" for "reset active".



Test functions CDM 12

(Example: If mode display = 3 and button 2 will be pressed, then pause is switched on.)

mode display	button 1 (mode)	button 2	button 3	buttons 2 + 3 together
0	mode 1	start	stop	repeat CD
1	mode 2	next track	previous track	repeat track
2	mode 3	search forward	search backward	single, double speed.
3	mode 4	pause ON	pause OFF	
4	mode 5	volume +	volume -	mute
5	mode 0	track -1	track -1	play selected track (read TOC if necessary)

CDM 12 error codes:

Error code	Meaning
0	No error
2	Focus error or no disc
7	Subcode error, no valid subcode
8	TOC error
10	Radial error
12	Fatal sledge error
13	Turntable motor error
31	Search time out
32	Search binary error
33	Search index error
34	Search time error
40	Illegal command
41	Illegal value
42	Illegal time value
43	Communication error
44	Reserved
45	HF detector error
48	Emergency stop

If "repeat CD" had been selected with the buttons 2 + 3 in mode 0 the display will be "99". At each beginning of a new track it will be displayed with two digits.

If "repeat track" had been selected with the buttons 2 + 3 in mode 1 the actual played track will be displayed.

By pressing of two buttons at the same time additional values will be displayed:

Buttons 1+2: The last occurred error code will be displayed (ref. to error code table). This error code will be reset after this retrieval or after a CDM12 reset (e.g. the next power on).

Buttons 1+3: The actual playing track will be displayed.

Buttons 1+2+3:

- a) No CD is playing: Program version and date of release..
- b) CD is playing: Max. / min. track number will be displayed.

Remark:

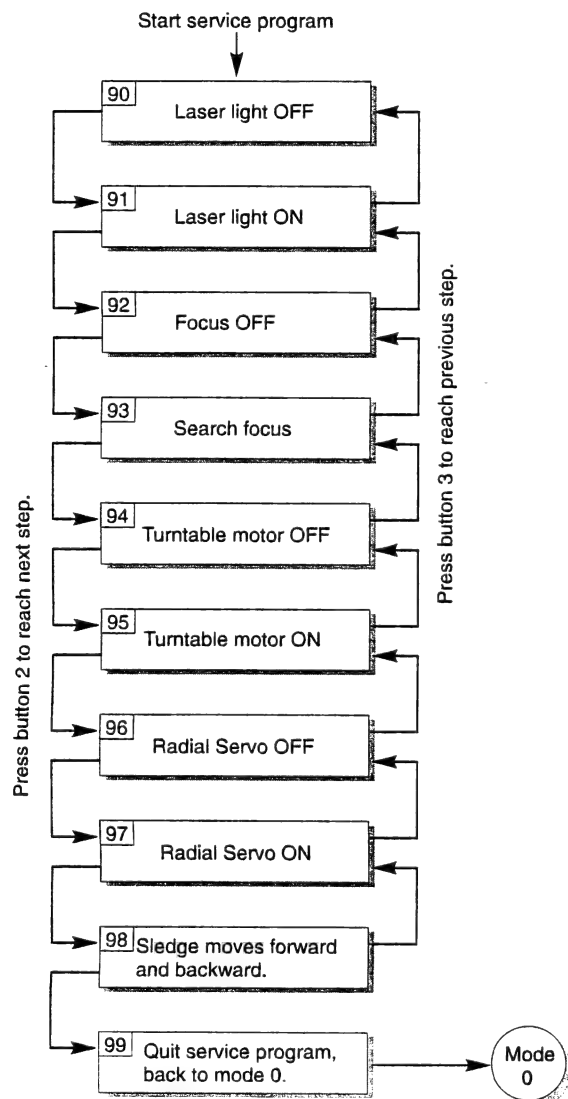
If commands will be sent to the CDM12 player, the display will flash. During this time no commands given by the buttons will be accepted.

While the table of contents (TOC) is read an 8 flashes in the display. In this way, the necessary time to read the TOC can be prolonged. So bad CDs can be recognised and taken out.

9.2. Special test functions of the CDM12 player

Service program of CDM12 (mode 9)

With this service program different functions of the CDM12 player can be tested.



How to call:

Switch main power OFF. Press button 1 - hold down - and switch main power on. (Remark: "Power ON - OFF" can also be done by disconnecting the wire bk./gy. from pin 6 of the sub transformer.)

Function:

The Wurlitzer CD control unit steps into mode 9 and runs the tests 90 up to 99. Mode 9 will be displayed continuously. While changing the test step it will be displayed with two digits

Remarks:

Starting test step 94 a CD has to be placed on turntable.

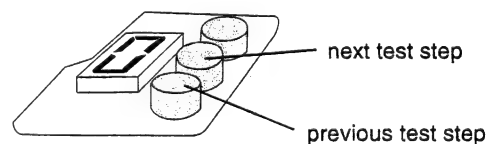
The button 1...
has no function during this test.

The button 2...
switches to the next test step.

The button 3...
switches to the previous test step.

Quit:

Press button 2 while test 98 is running. Control unit steps over test 99 to mode 0 automatically.



Test results:

Test 91: You can check the laserlight with an infrared indicator.

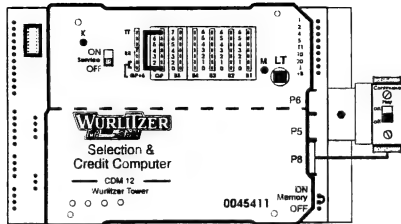
Test 93: With out a CD: laser lense moves up and down. If you put a CD on the turntable while the test runs the lens stops moving if it finds the focus point.

Test 95: The turntable motor must spin.

Test 98: The sledge moves itself from inside to outside and back again. If this test is successful the speed of the disc must change to lower speed at the outside of the disc.

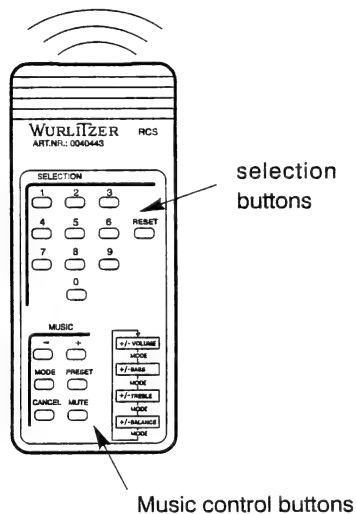
10. Accessories (not included in standard equipments)

10.1. Continuous play switch (Part-No. 0034410)



The continuous play switch has to be connected to P8 of the SCC unit. If it is set to "ON" the jukebox plays continuous random tracks. If a track is selected over the keyboard the continuous play will be interrupted immediately and remains after playing all the selected songs.

10.2. Infrared remote control for amplifier F91 (40435)



If credit is given or free play is programmed a CD can be selected with the buttons 0 to 9 and R.

Double button functions as required in the service programmes (i.e. press button 5 -hold down- and press button R), are impossible. For this you only can use the keyboard of the jukebox.

The meaning of the music control buttons is according to the buttons on the control terminal on the rear side of the jukebox. (ref. to the prev. chapter)

The receiver eye of the infrared remote control is located above the digital display (behind the Wurlitzer logo of the front pane). Beam this point directly if possible.

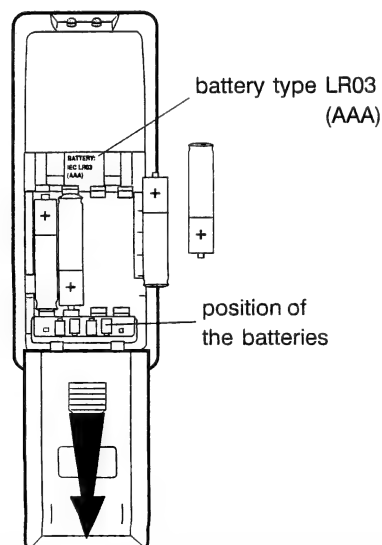
The common control terminal can be connected further more. It can be mounted outside to display the actual mode.

Batteries will not be delivered. Necessary are 4 micro cells type LR03 (AAA).

To open the battery compartment move the cover like shown in the picture.

Needed battery type and position of the batteries in the hand transmitter are shown on the casing.

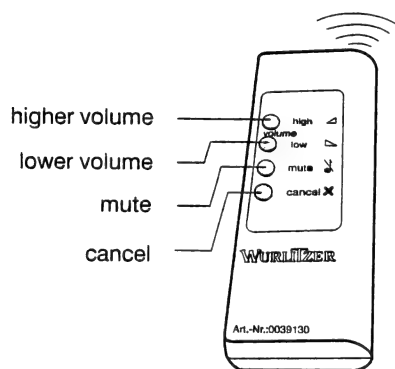
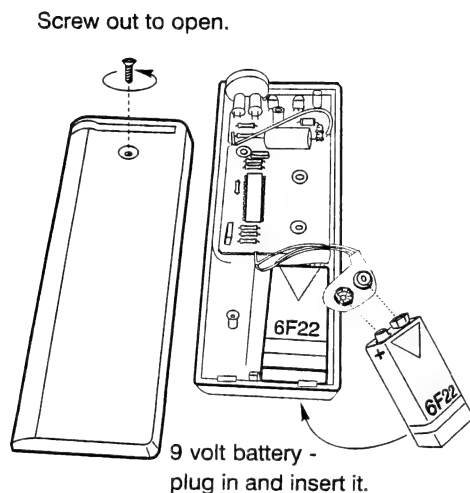
Part no. of the hand transmitter: 0040443.



10.3. Infrared remote controller for amplifier I84

As desired infrared remote controller can be installed from factory or can be delivered as conversion kit. If it is already installed you can find the hand transmitter in the cashbox.

10.3.1. Infrared remote control (part no. 0039075)



For operation insert a 9 volt battery into the hand transmitter (part no. 39130). Then in a range of approximately 45-60 ft you can control the following functions wireless:

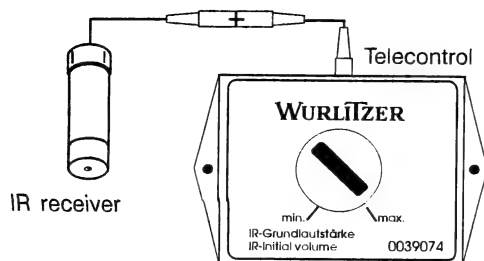
Meanings of the buttons...

- **HIGH:**
Increases the volume. Press the button more times in very small distances to step up the changing speed.
- **LOW:**
Decrease the volume. Press the button more times in very small distances to step up the changing speed.
- **MUTE:**
As long as this button is pressed the jukebox is muted.
- **CANCEL:**
Cancels the playing track. If 'albumplay' is enabled the next track will be played.

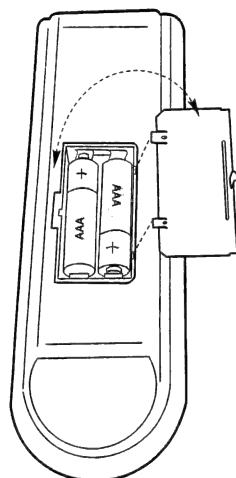
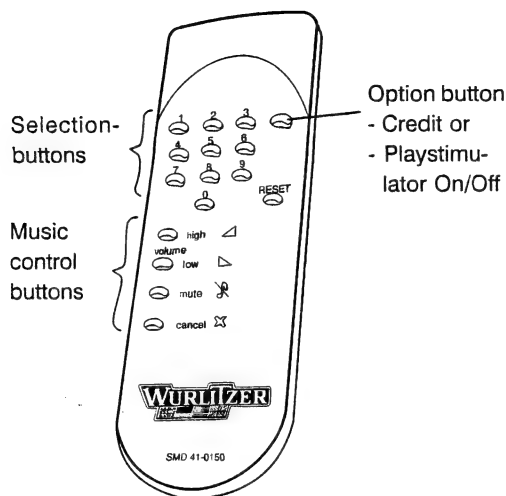
Pre-set volume setting

Inside of the jukebox the control unit for the infrared remote control „Telecontrol“ is located. With the knob of this unit, a 16-position switch, you can select the pre-set volume the jukebox should start every time it is switched on.

The result of turning of this knob becomes audible only after the jukebox has been switched off for a time of some ten seconds.



10.3.2. Infrared remote volume and selection system (part no. 0047522)



The meaning of the buttons...

- BUTTONS 0 - 9 and RESET
If credit is given or free play is programmed a CD can be selected with the buttons 0 to 9 and R.

Double button functions as required in the service programmes (i.e. press button 5 -hold down- and press button R), are impossible. For this you only can use the keyboard of the jukebox.

- OPTION BUTTON:
This button can be used either as credit button or to switch on and off the continuous play function.
- HIGH:
Increases the volume.
- LOW:
Decreases the volume.

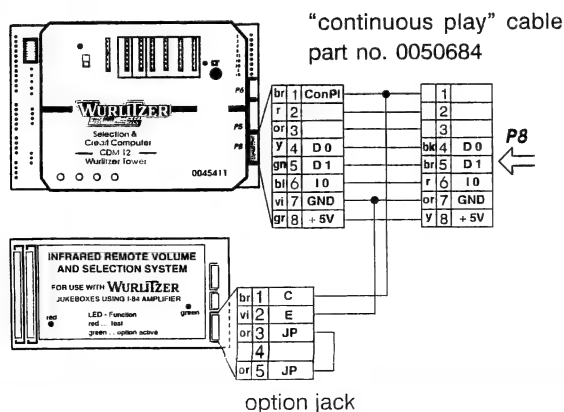
The jukebox saves the actual volume if it is switched off.

- MUTE:
The first button operation switches the sound off. The next operation switches it on e.t.c. ('Toggle-function').
- CANCEL:
Cancels the playing track. If 'albumplay' is enabled the next track will be played.

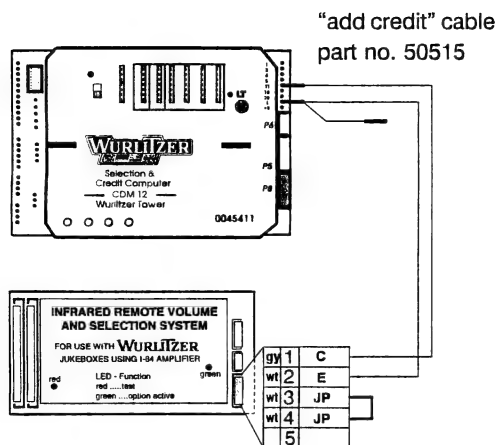
Batteries will **not** be delivered. Two micro cells Typ LR03 (AAA) are needed.

Installing the continuous play option for the OPTION button:

- Insert the 5 pin plug of the "continuous play" cable into the jack marked "Option" on the infrared remote control box. Remove plug P8 of the RH side of the SCC unit and insert the 8 pin plug of the opposite end of the cable into jack P8. Insert P8 itself into the socket of the cable. If your machine is equipped with a continuous play switch it can be connected in series. So insert at first the continuous play switch into the jack marked "P8" and then the plug of the cable into the bottom jack of the continuous play switch.



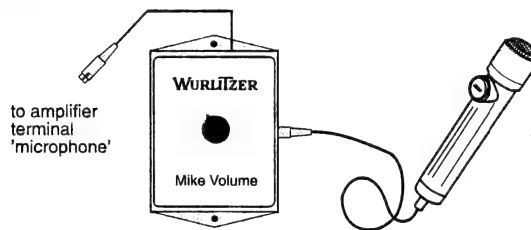
- Whenever the OPTION button is pressed the continuous play mode is started. Pressing the button again will turn off the continuous play feature. Whenever the power is interrupted to the jukebox, the continuous play feature is automatically turned off.



Installing the "add credit" option for the OPTION button:

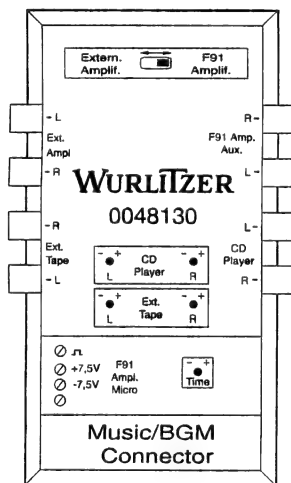
- For this option a different option cable is used. This cable must be purchased separately (part no. 50515). Each time the OPTION button on the hand transmitter is pressed, the unit will add 1 credit to the jukebox.
- Insert the 5 pin plug into the jack marked "Option" on the infrared remote control box. At the top RH side of the SCC unit remove the plug inserted into the pin marked "1". Insert the black plug from the white wire of the gray/white cable onto this now empty jack. Connect the black plug previously removed onto the free pin connected to the gray/white cable. Remove the black plug connected to the pin marked "T1". Connect the black plug on the gray/white cable to the pin marked "T1".

10.4. Microphone kit (part no. 0006953)



This unit enables the use of the jukebox as a paging system, when playing as well as during idling periods. If the paging microphone is switched on while the jukebox is playing, the music fades away or will be muted for this period. This kit is to be connected at the microphone socket of the amplifier. The length of the cable between micro pre-amp and the jukebox is approx. 45 ft / 15 m.

10.5. BGM-Connector



This equipment offers two features:

- The sound of an external source (300mV - 1V), e.g. radio or tape, will be reproduced over the speakers of the jukebox with reduced volume. A selection over the jukebox will mute this source, and it returns only after all selections have been played. (Time-lag can be adjusted).
- Distribution of the sound from the jukebox to an existing background system (amplifier). The sound of this equipment is switched off as long as the jukebox is playing. The hook-up for this adapter is the same as the microphone.

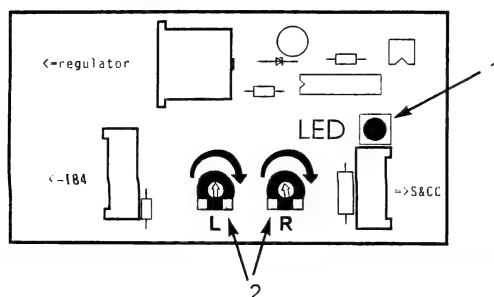
BGM connector for I84 (part no. 0035579)

BGM connector for F91 (part no. 0048133)

(part numbers for the different conversion kits)

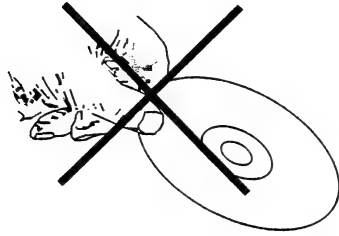
10.6. Background-music level adapter (part no. 0031056)

BGM-Adapter



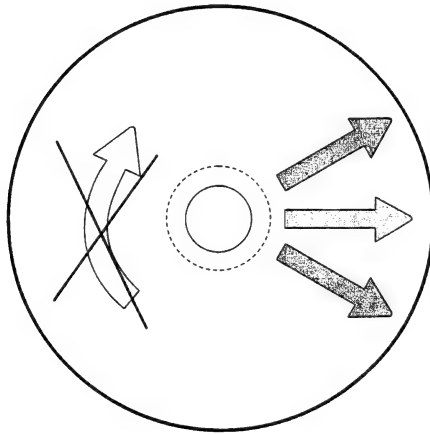
The BGM adapter is controlled by the SCC unit. It operates as soon as CDs are playing as declared for BGM. While BGM is active the red LED lights (1). The volume of a playing BGM-track will be reduced. The volume reduction from normal sound is adjustable by two pots (2) on this board. Nevertheless the resulting volume depends also on the basic volume of the jukebox.

11. Player and CD cleaning



Dust, fingerprints or other dirt on the disc surface can cause skipping, jumping or sticking problems. Because of this never touch the surface of a disc! However it is rather easy to remove nicotine, dust or fingerprints.

11.1. CD cleaning



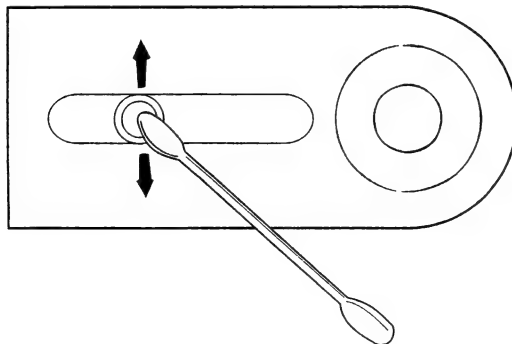
Nicotine, dust, fingerprints:

Dust can be removed with a lintfree soft cloth. If necessary, remove heavy dirt or fingerprints with a moistened soft cloth soaked in a solution of water and a detergent. Never use record cleaning sprays or anti static sprays! Furthermore, do not use other types of cleaners containing benzene, thinner or other solvents. These liquids will cause damage to the surface of discs. Move the cloth from the inside towards the outside and not in circular motion.

Removing scratches:

Use a soft cloth and a soft polish .

11.2. Laser lens cleaning



Smoke and dust soils the lens. It can be cleaned with a cue-tip soaked in a detergent (i.e. "B04" from KONICA). Place the tip on the lens and press down carefully.

Caution!

The whole laser unit is very sensitive!

- Move the cue-tip only in the direction shown in the picture (perp. to the sledge direction).
 - Do not scratch the special treated surface of the lense.
 - The cleaning solution must not run into the focus unit.
- Keep away metal parts from the lens unit. A strong magnet is located underneath the lens. It attracts also smallest metal parts and can so block the complete unit.



12. Steps to solve mechanical problems

In case of a mechanical error the software tries to solve the problem itself. If this is not successful the mechanism switches itself off. Then the display shows an error code (ref. to chapt. 7.2.1. page 46). The jukebox is then out of order.

12.1. Treating simple errors

Switch the jukebox off and on several times.
(The software tries to solve the problem again.)
No success ? Step to chapter 12.2.

12.2. Treating simple errors by hand

1. Switch off the jukebox
2. Move the gripper by pressing against the motor as far as the CD can be taken out by hand.
3. Take the CD out of the gripper.
4. Insert the CD in the corresponding compartment.
5. Switch on the jukebox, it will be run automatically:
 - Error elimination
 - Initializing phase
 - jukebox ok.
6. No success ?
Step to chapter 12.3.

12.3. Set the mechanism to '0' position

1. Power OFF!
2. Open the Jukebox.
3. Open the mechanism housing, replace any CD's that may have been dropped.
4. Move gripper to RH. 0-position.
 - Move, by pressing against the gripper motor, gripper holder of selection sledge so that LH. side of gripper holder aligns with RH. side of pressure disc holder.
 - If RH. position impossible:
Move gripper to the LH. 0-position, so that right edge of gripper holder aligns with LH side pressure disc holder.
5. Remove the left magazine. (to reach the gear).
6. Free the selection sledge.
 - The sledge has to be at least 1,3 " (3 cm) over the housing bottom. Therefore move the sledge up and down by hand using the toothed belt wheel on the top LH. side of gear group.
7. Insert the left magazine.
8. Check the fixing of the magazines by hand.
9. Close the mechanism housing.
10. Set the slide switch 'SERVICE' on the SCC unit to ON.
11. Power ON.
12. Delete the stored data of the jukebox.
 - Press 'LT' button
 - Press 'LT' button again and hold it for at least 6 sec.

Followed by:

 - an automatic orientation phase
 - an automatic initialization phase
 - the display of the program version
13. Programming
 - insert CD's if necessary
 - program number of inserted CD's in service level 1 button 5 as follows:
 - Press selection button R -hold down- and press selection button 0 than release both buttons.
 - Press selection button 1. Service level 1 is reached. Display is: 1 _ _ .
 - To reprogram press selection button 5 -hold down- and press selection button R. Enter the desired number of CD's with two digits. (expection: 100 CD's = 00)
 - program options as desired
14. Switch to normal operation mode
 - Set the slide switch 'SERVICE' on the SCC unit to OFF.
 - Press 'LT' button on the SCC unit once.
15. Close the jukebox.

13. Declaration of conformity - Konformitätserklärung

Product Description:**Geräteart:****Jukebox / Musikbox**

Model No.:**Typenbezeichnung:****Rainbow**

Directives Complied With:**Angewandte EG-Richtlinien:**

73/23/EEC

Low Voltage Directive
Niederspannungsrichtlinie

89/336/EEC

EMC Directive
Elektromagnetische Verträglichkeit**Standards Used:****Technische Vorschriften:**

EN 50081-1

Electromagnetic Compatibility
Generic Emissions Requirements
Elektromagnetische Verträglichkeit
Fachgrundnorm Störaussendung

EN 50082-1

Electromagnetic Compatibility
Generic Immunity Requirements
Elektromagnetische Verträglichkeit
Fachgrundnorm Störfestigkeit

EN 60335-1

Safety Of Household And Similar
Electrical Appliances
Sicherheit Elektrischer Geräte Für Den
Hausgebrauch Und Ähnliche Zwecke

EN 60335-75

Safety Of Household And Similar
Electrical Appliances
Sicherheit Elektrischer Geräte Für Den
Hausgebrauch Und Ähnliche Zwecke

EN 55022

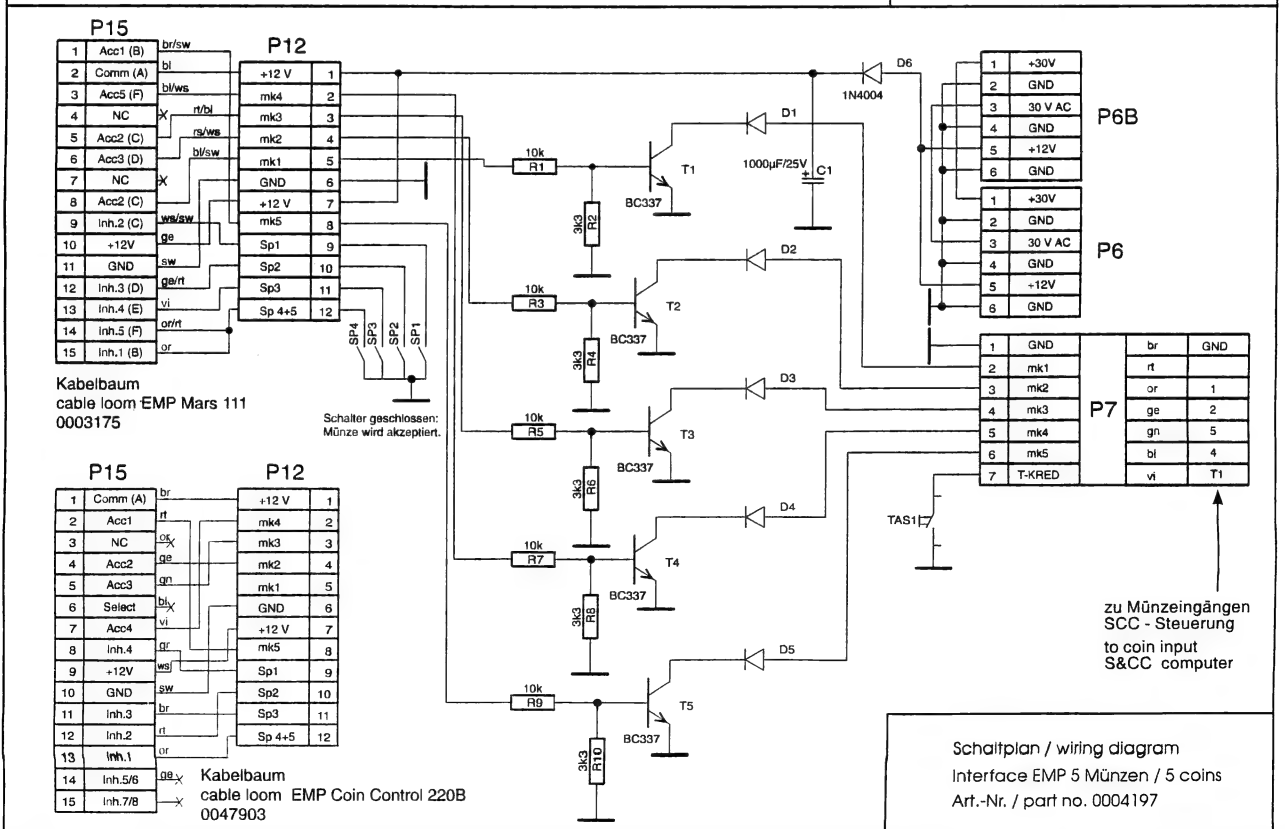
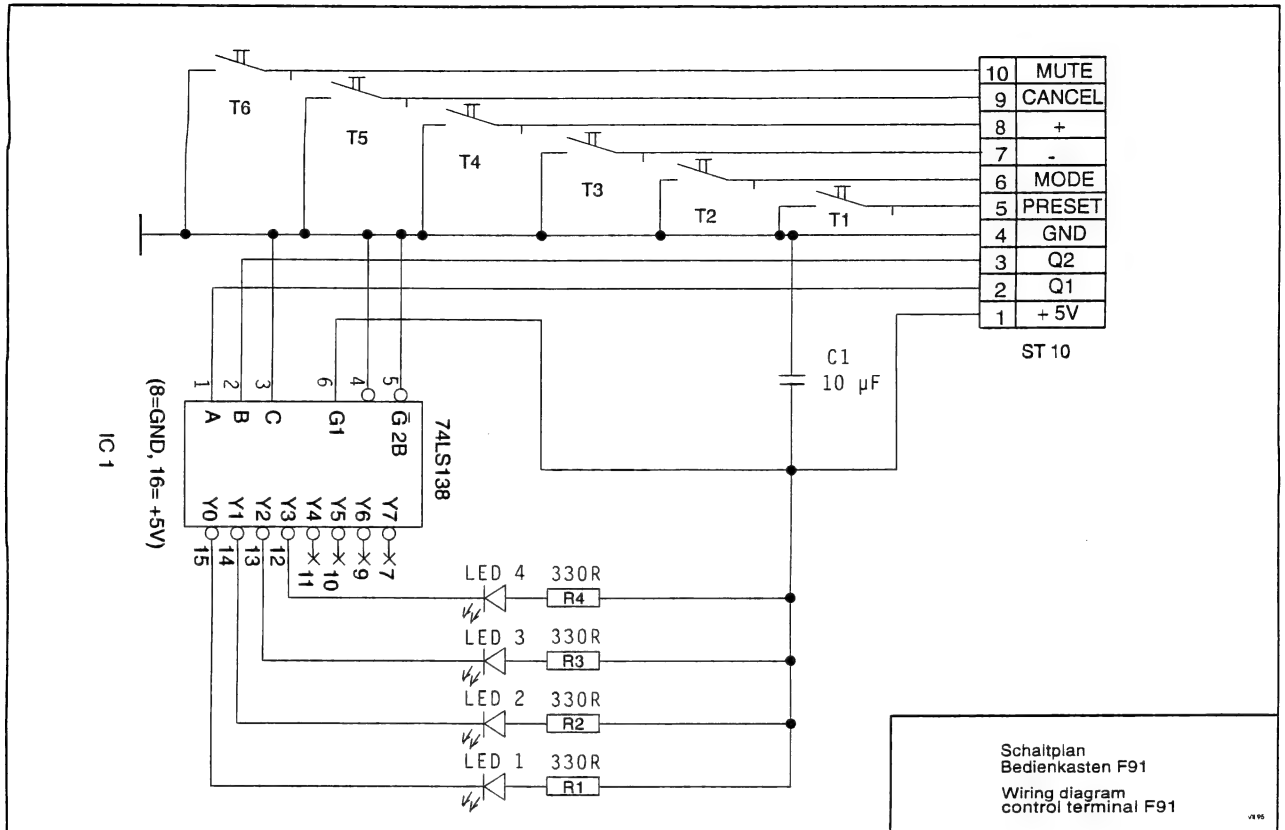
Limits And Methods Of Measurement Of Radio
Interference Characteristics Of Information
Technology Equipment.
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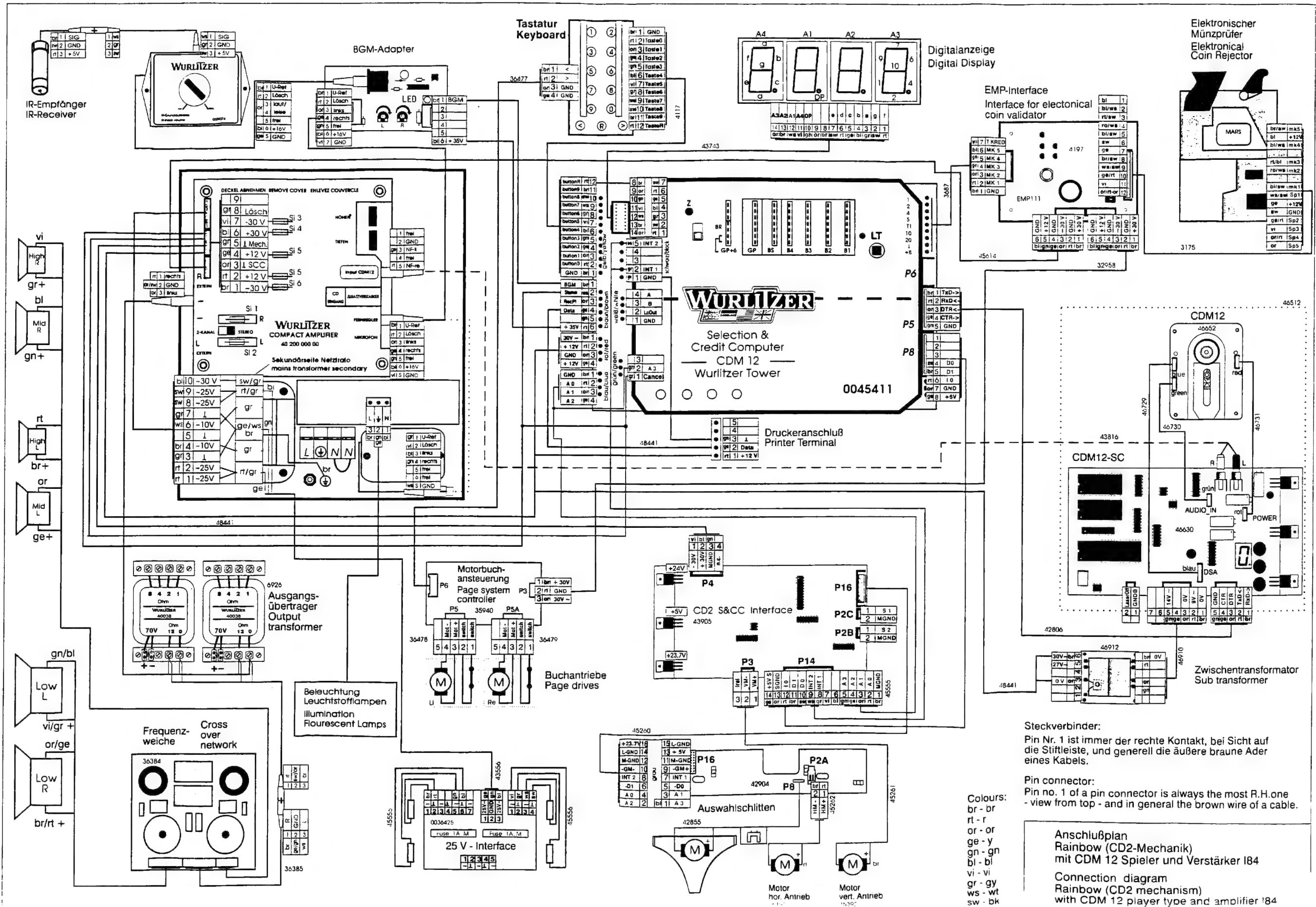
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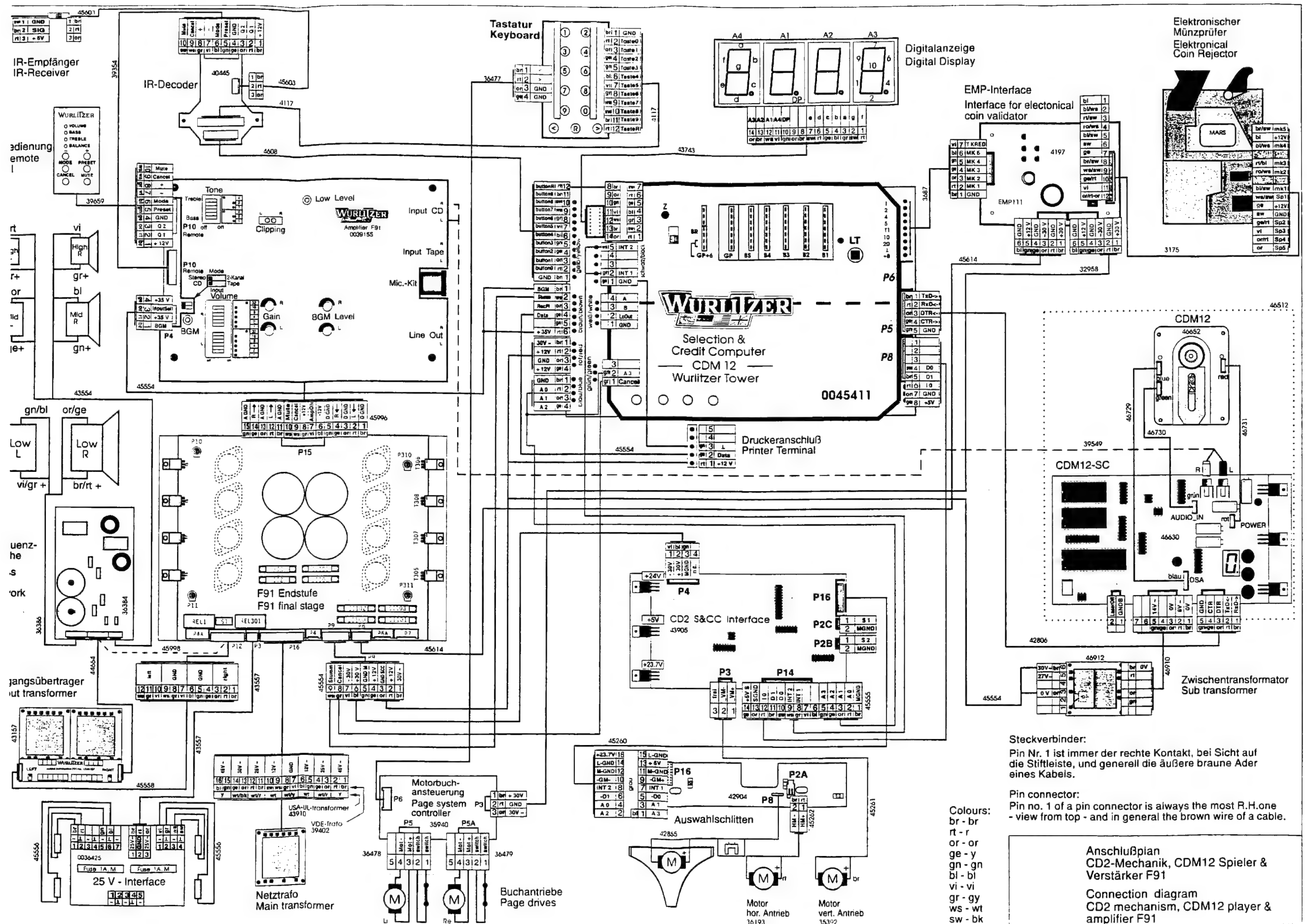
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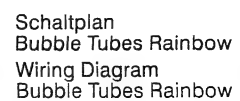
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14. Wiring diagrams

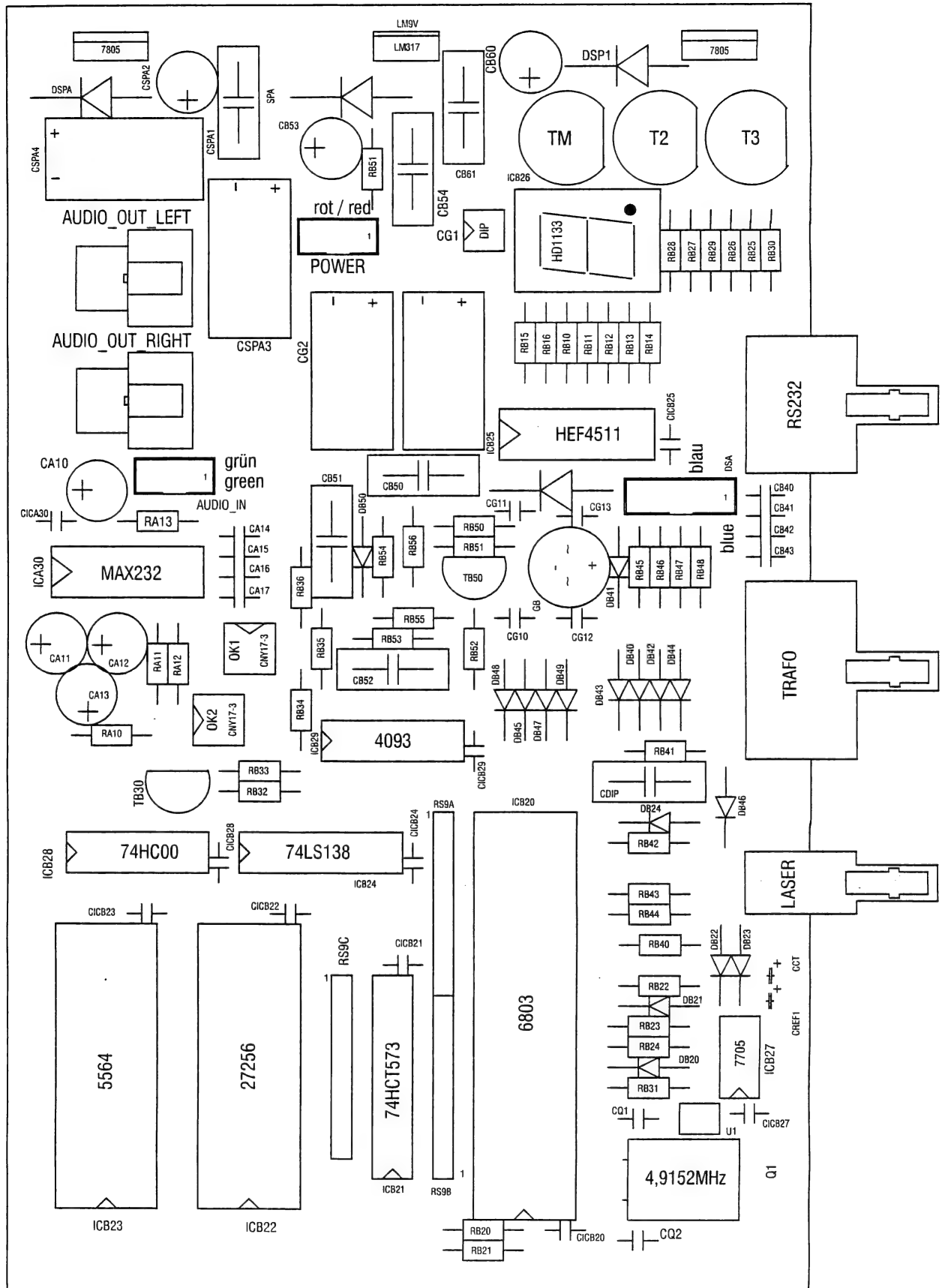




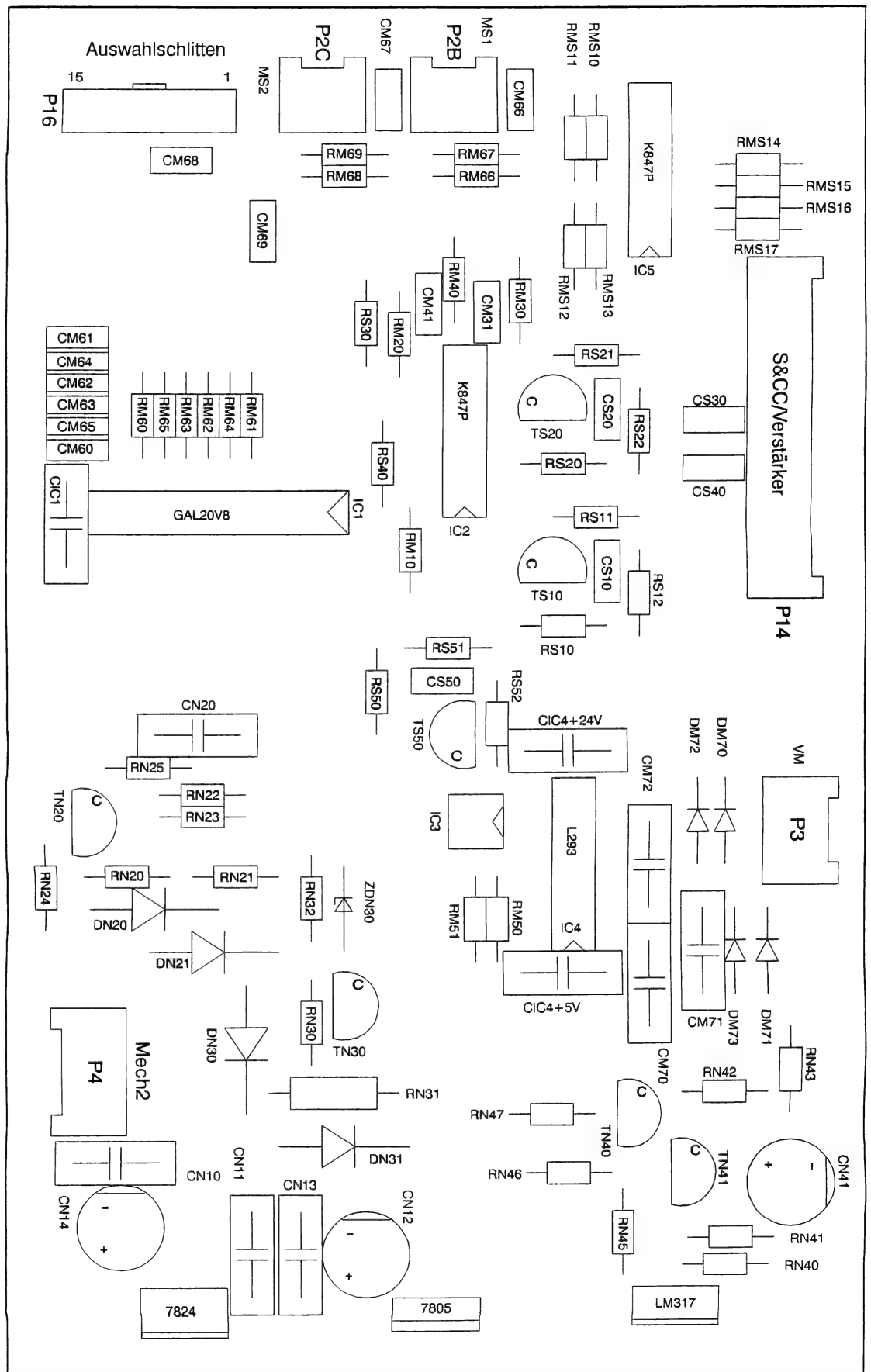




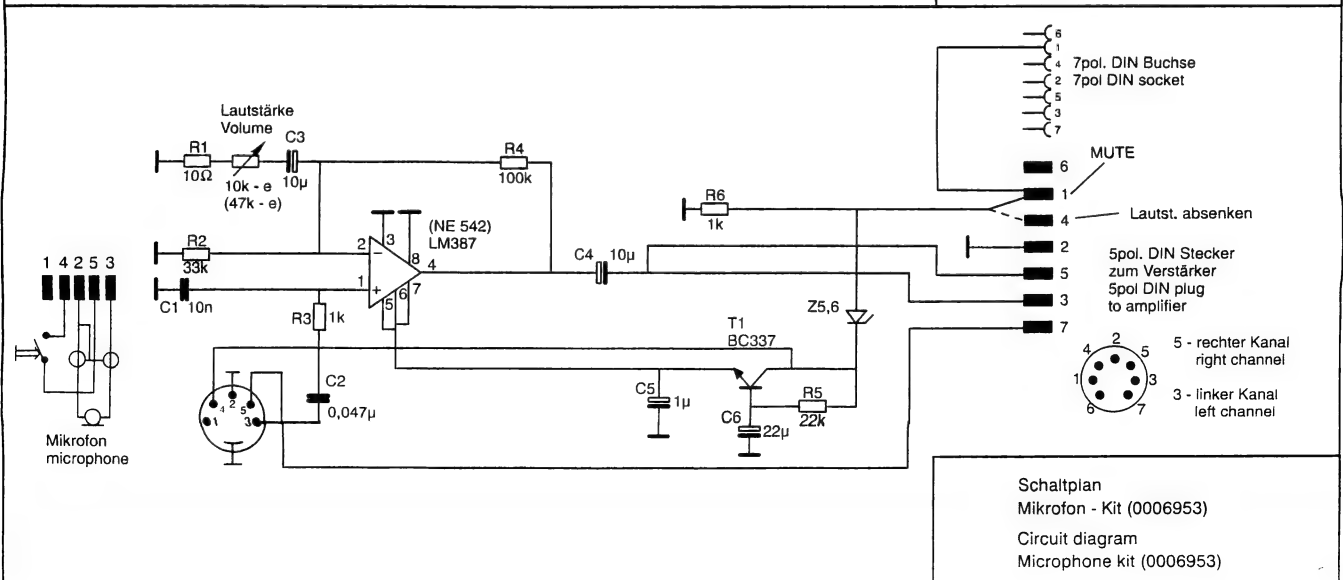
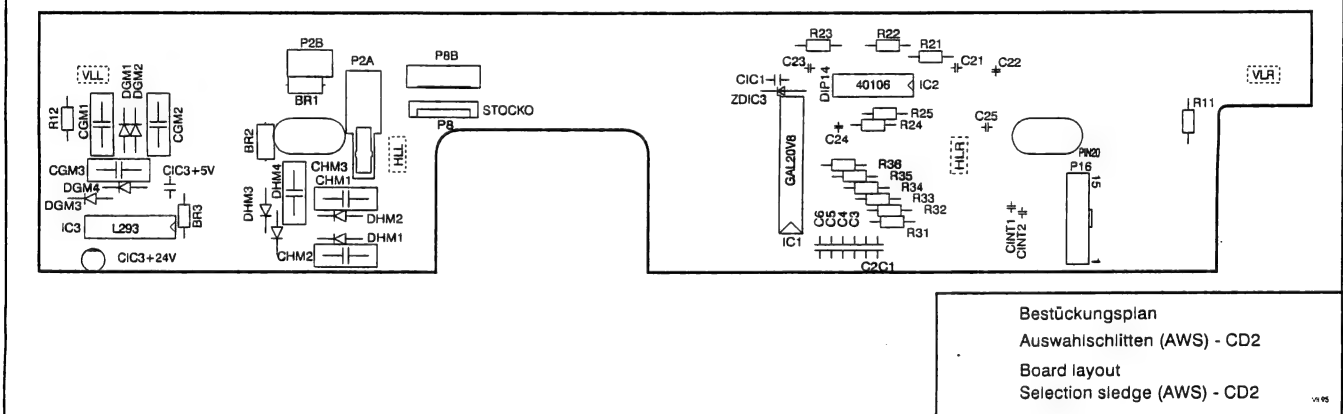
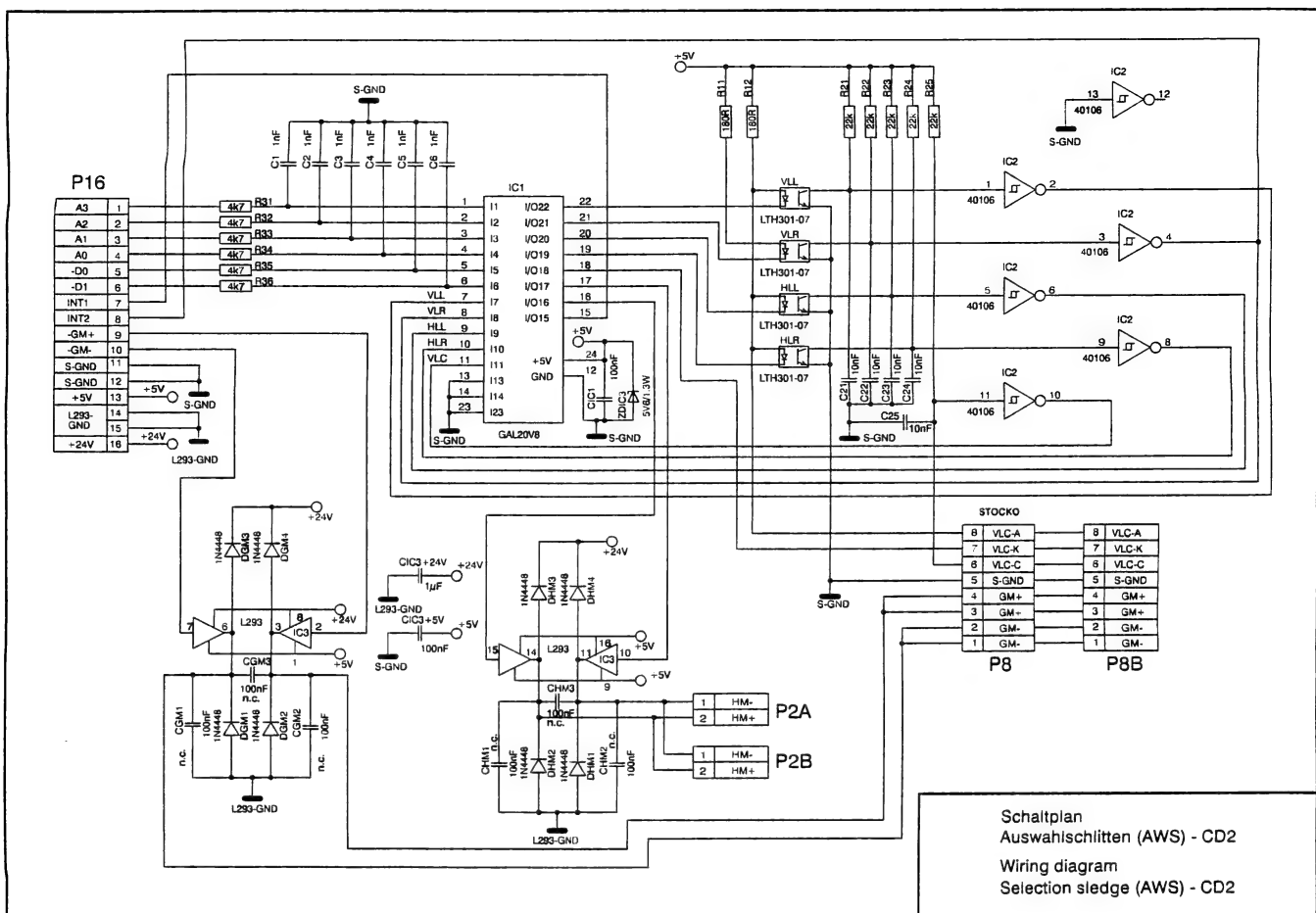


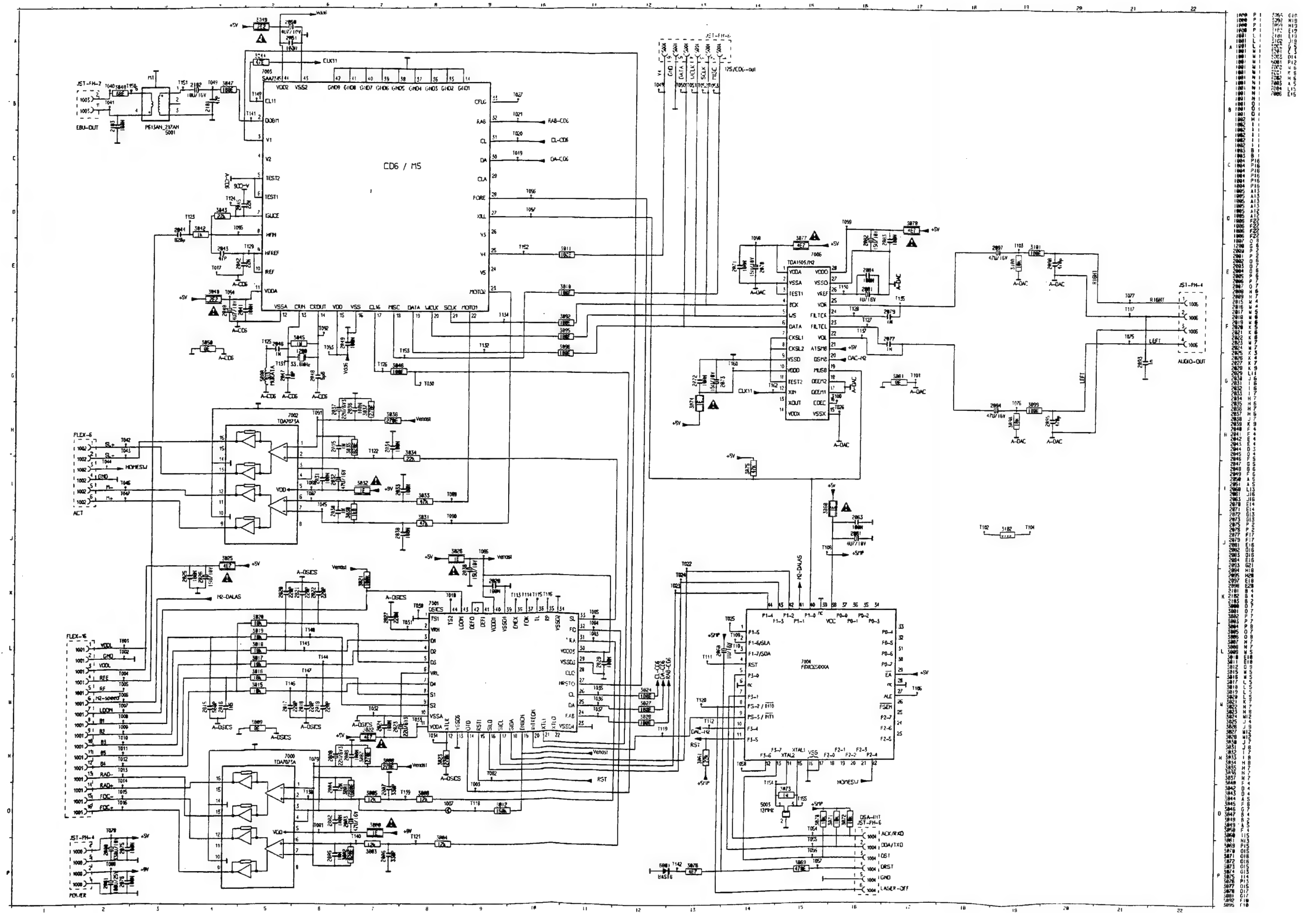


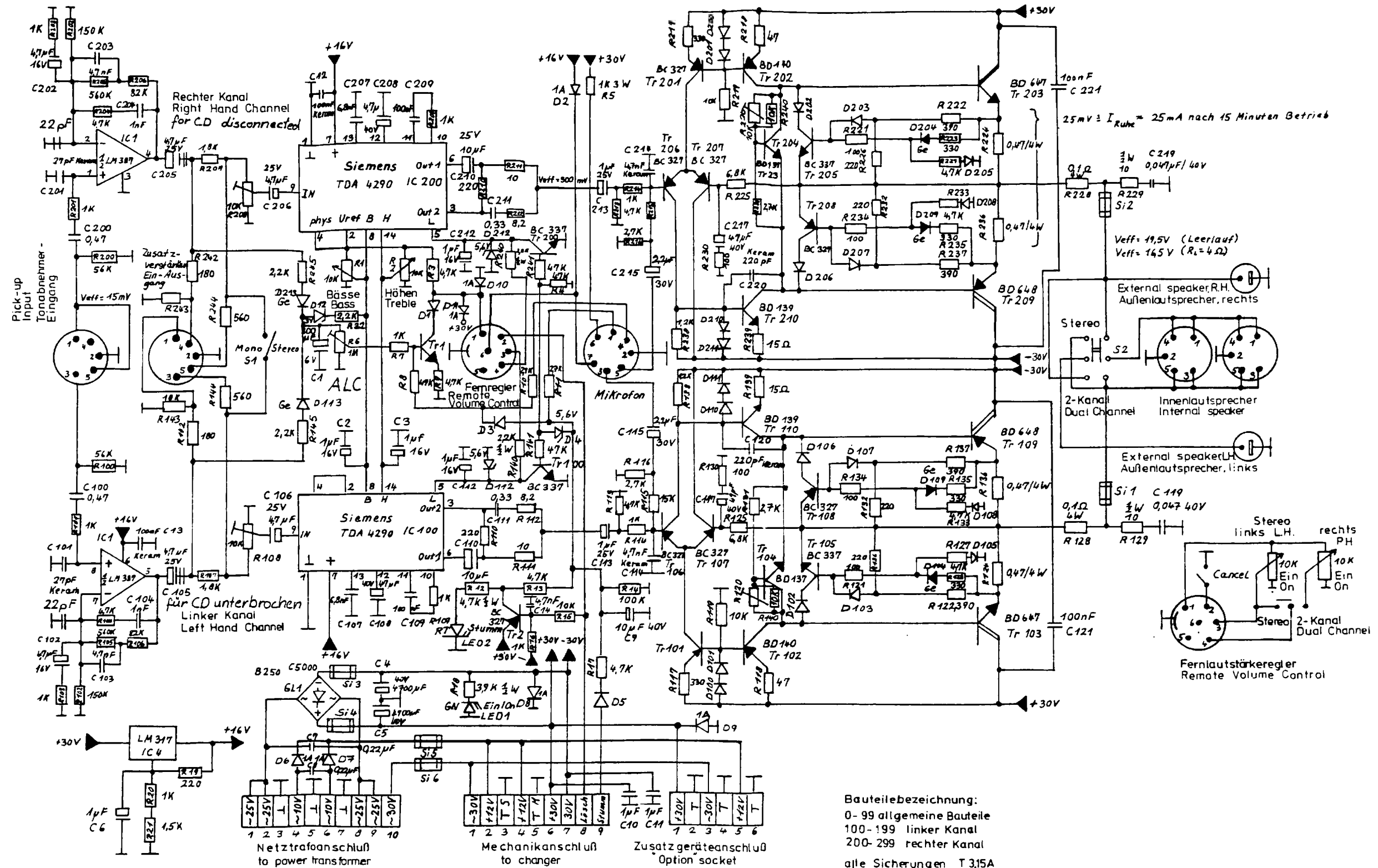
Bestückungsplan
CDM12 SC-Steuerung
Board Layout
CDM12 Serial Controller



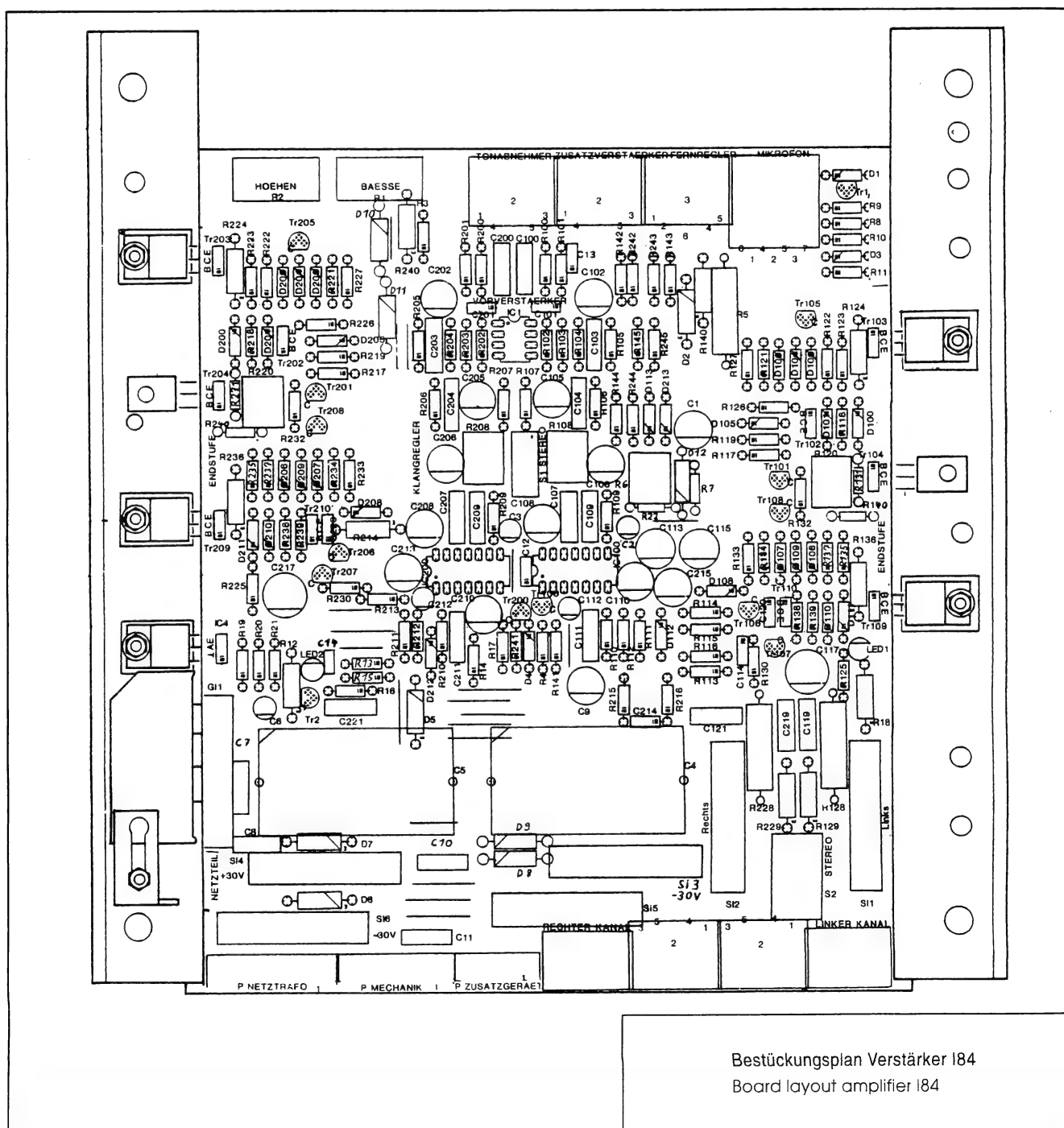
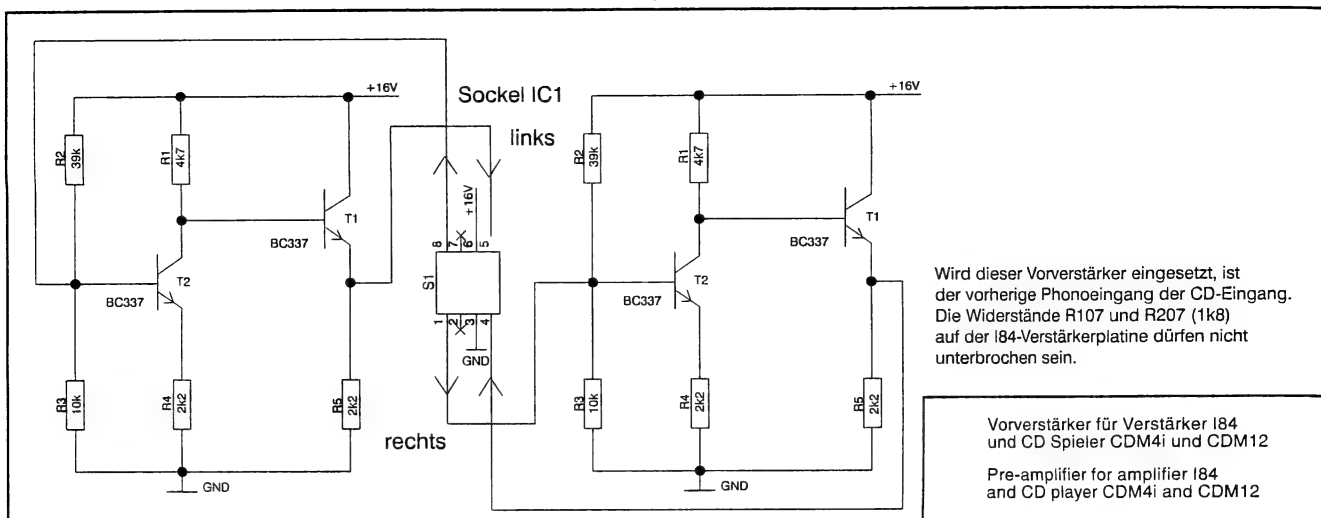
Bestückungsplan / board layout
CD2-SCC Interface

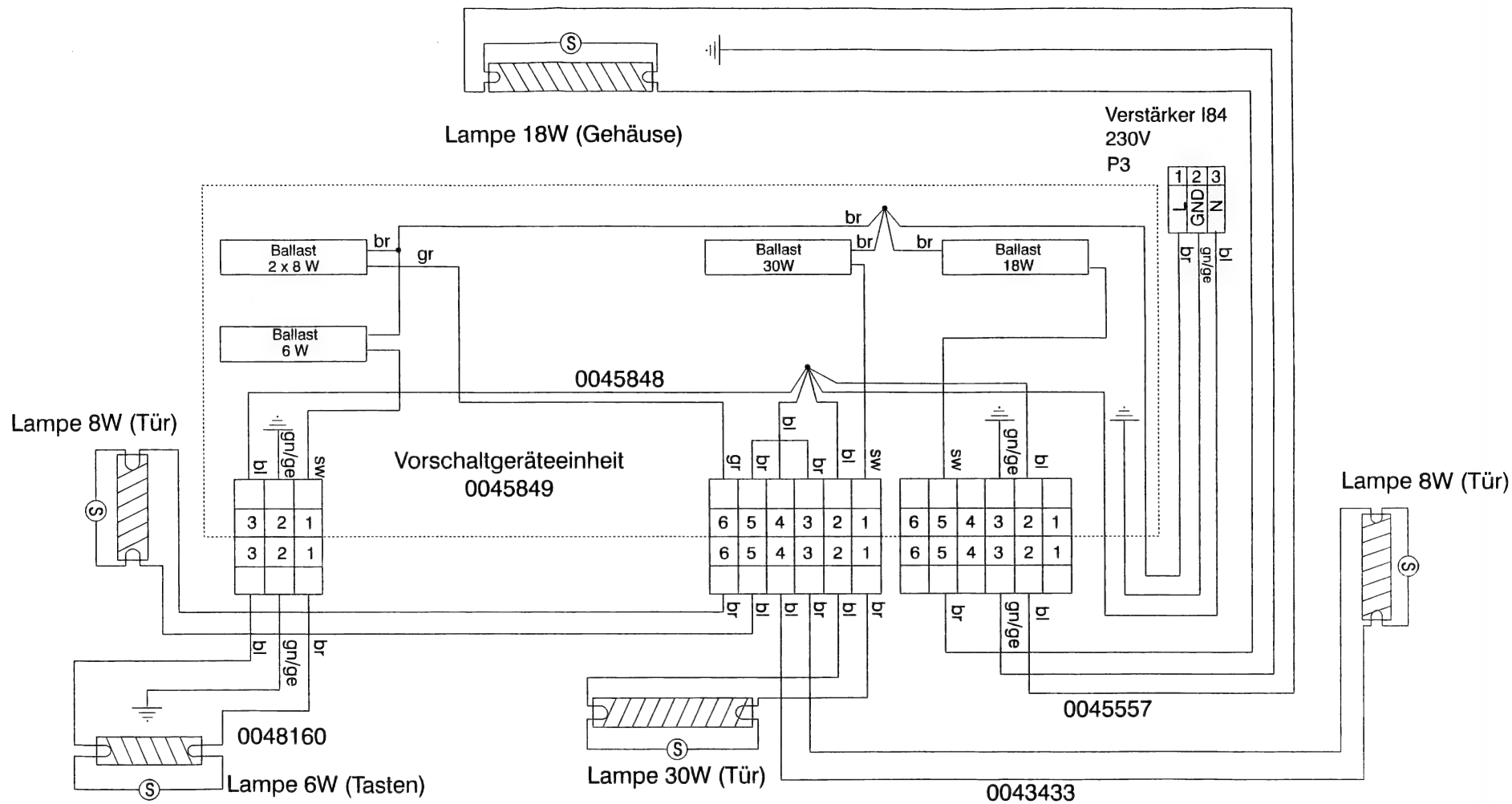




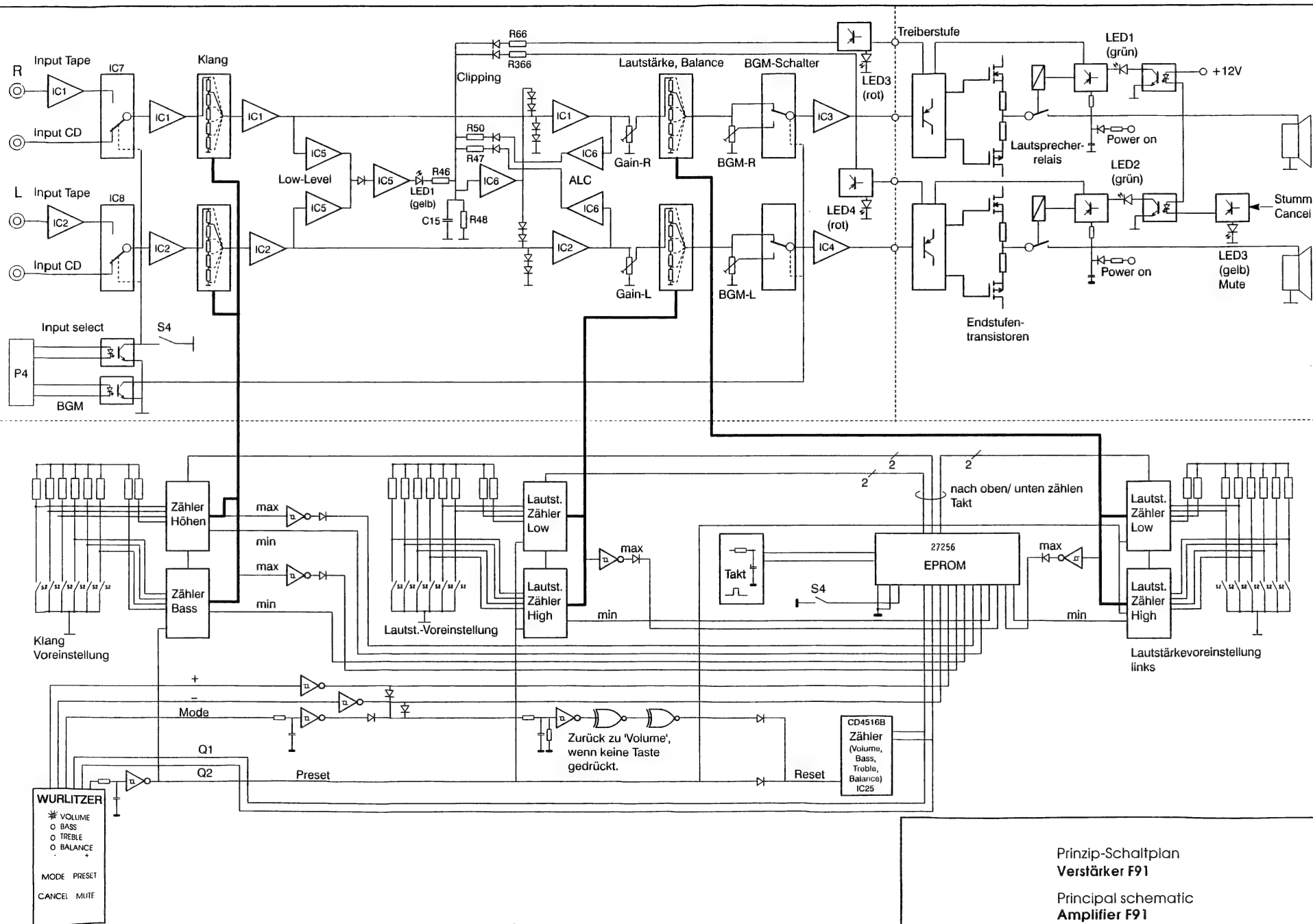


Schaltplan
Verstärker 184
Wiring diagram
Amplifier 184



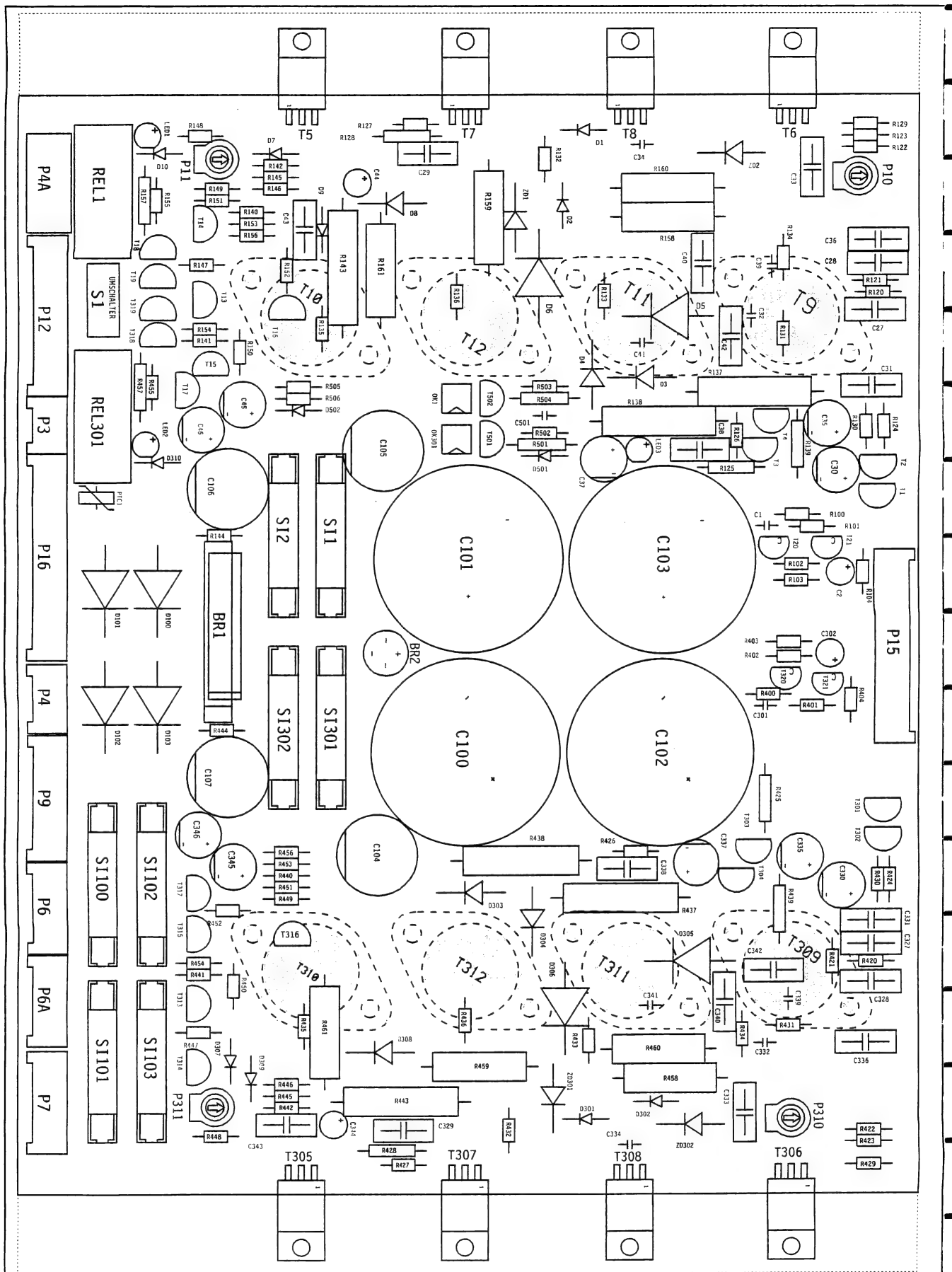


Verdrahtungsplan
 Vorschaltgeräteeinheit 230V, Rainbow
 Wiring diagram
 Ballasts unit 230, Rainbow

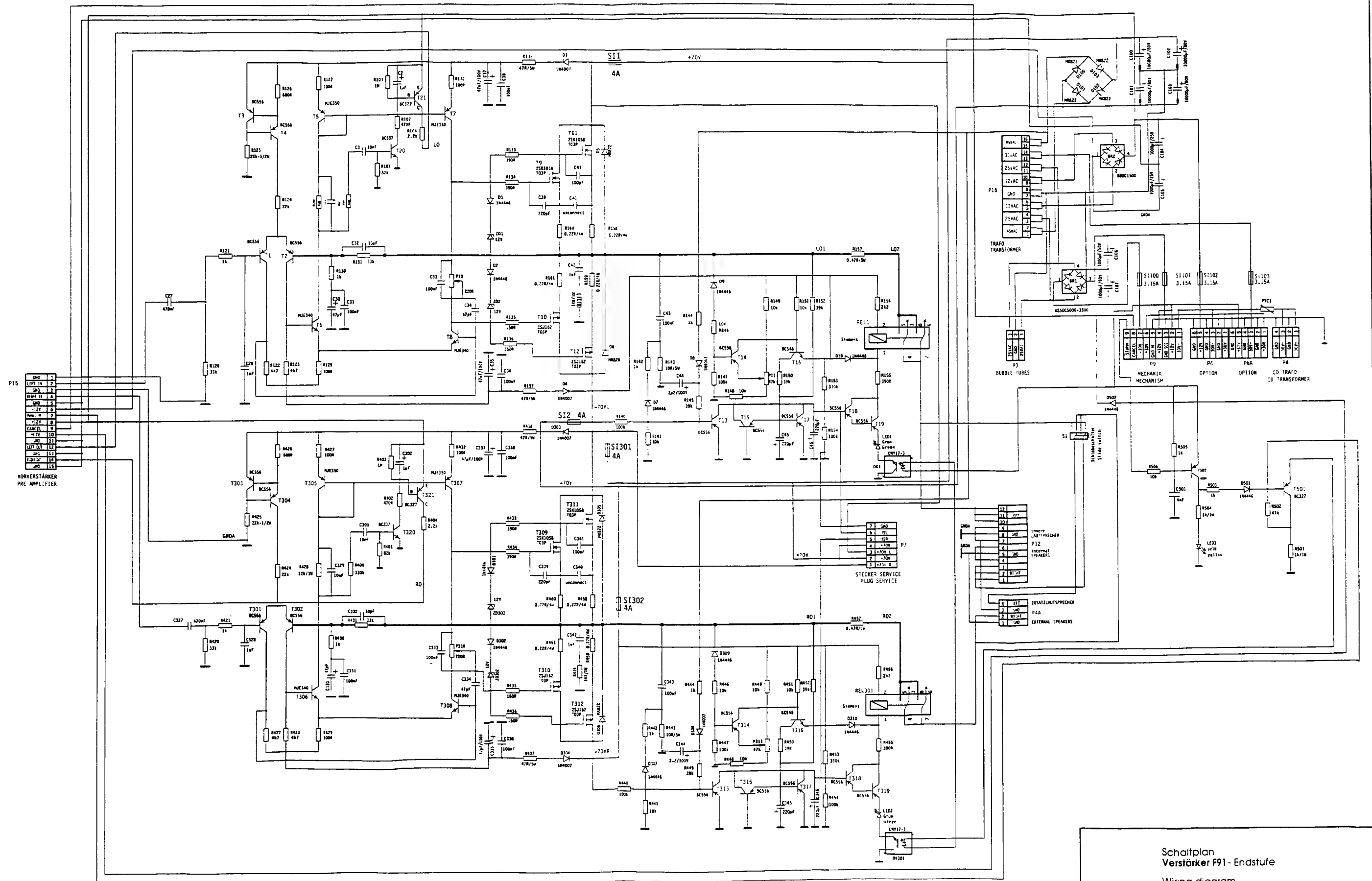


Prinzip-Schaltplan
Verstärker F91

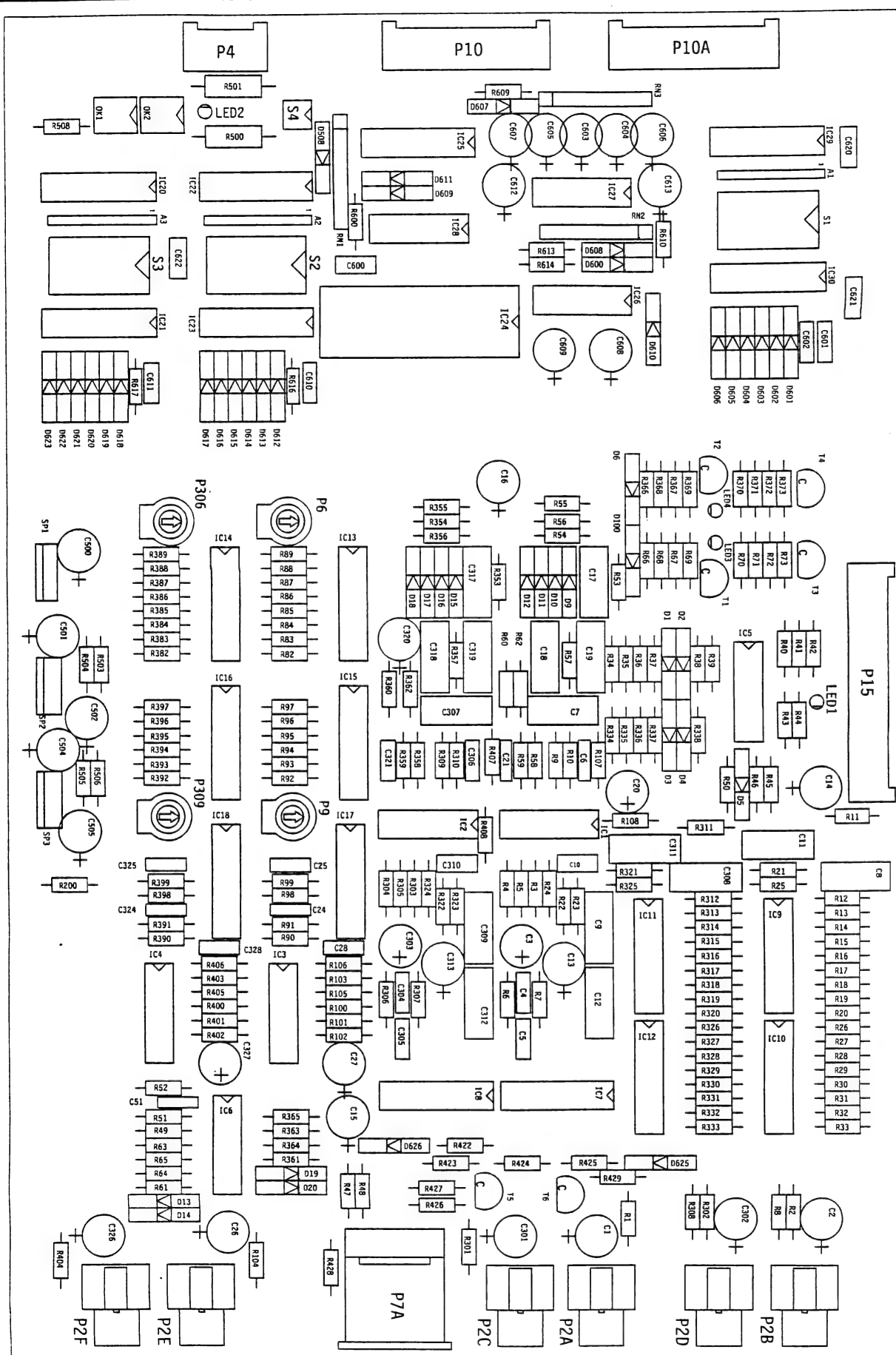
Principal schematic
Amplifier F91



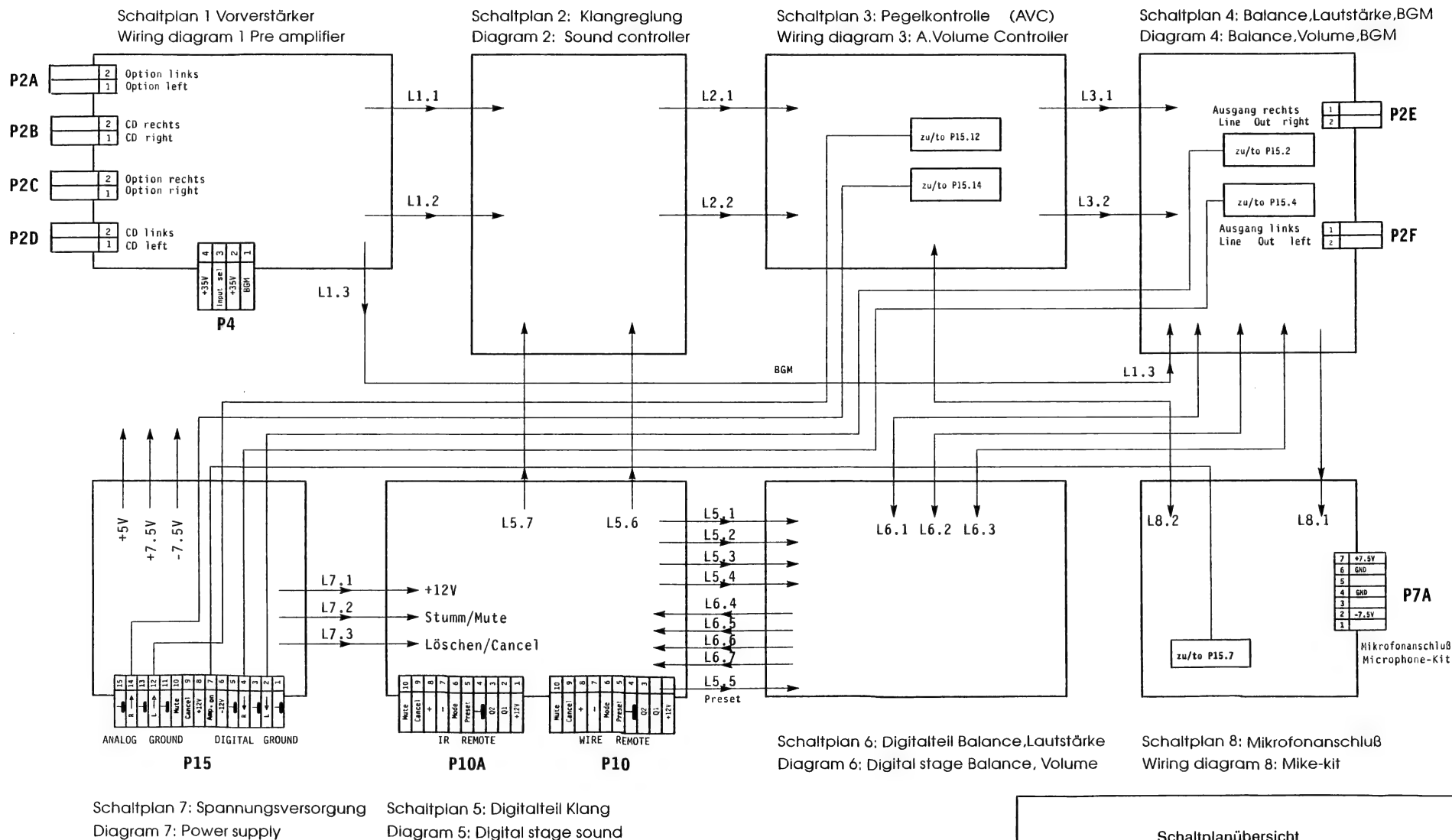
Bestückungsplan
Endstufe Verstärker F91
Board layout
Power amplifier F91

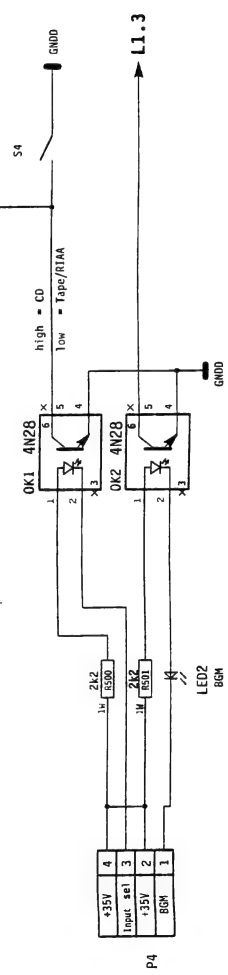
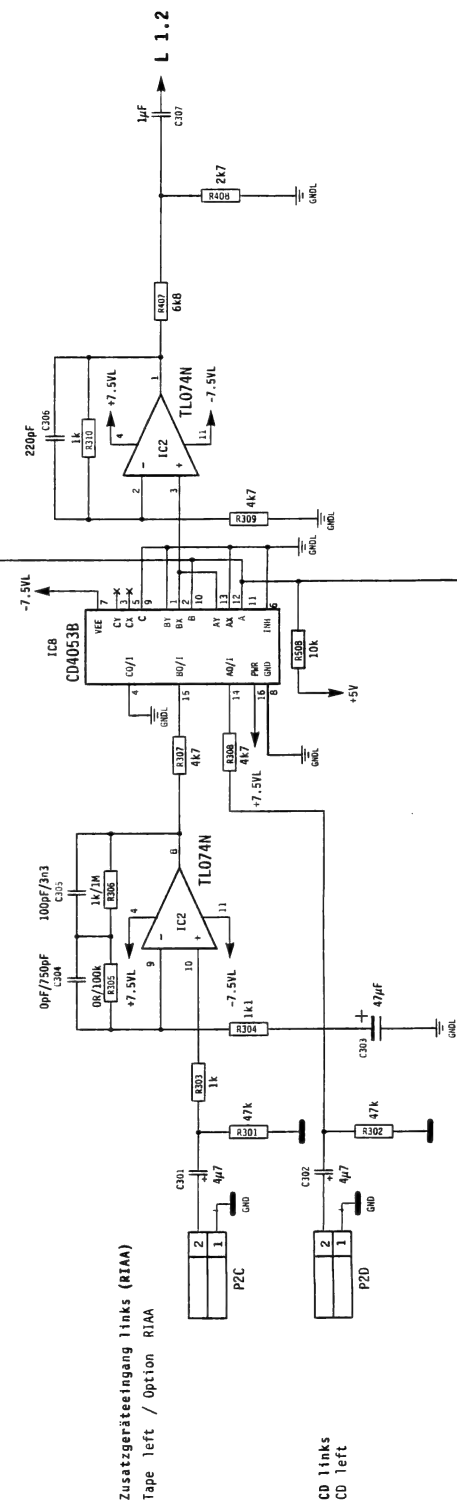
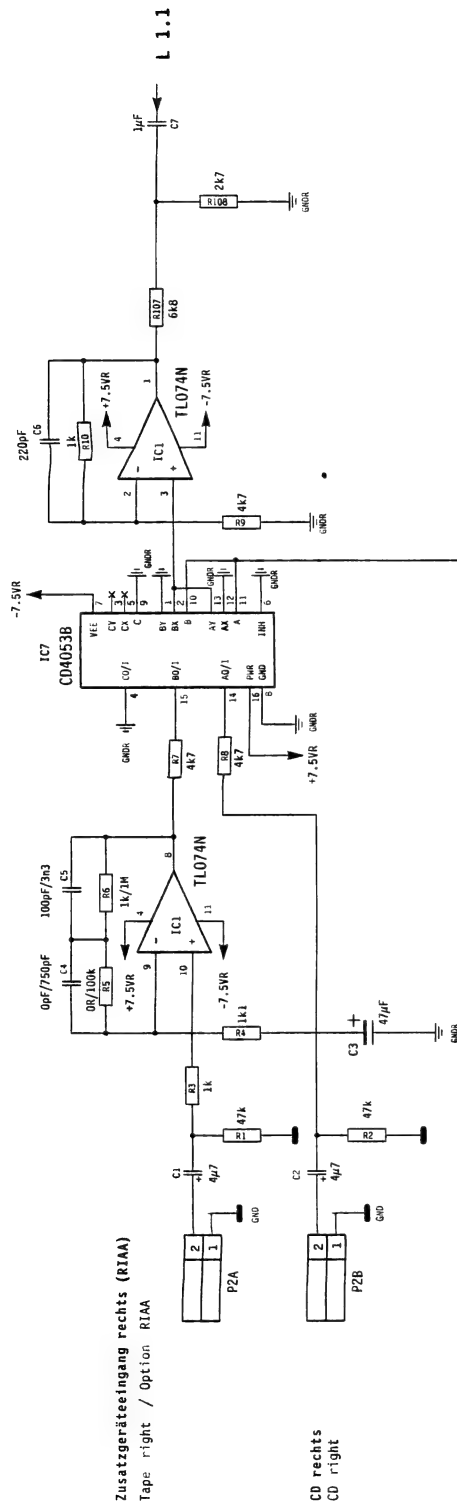


Schaltplan
Versterker F91 - Endstufe
Wiring diagram
Amplifier F91 - Power amp

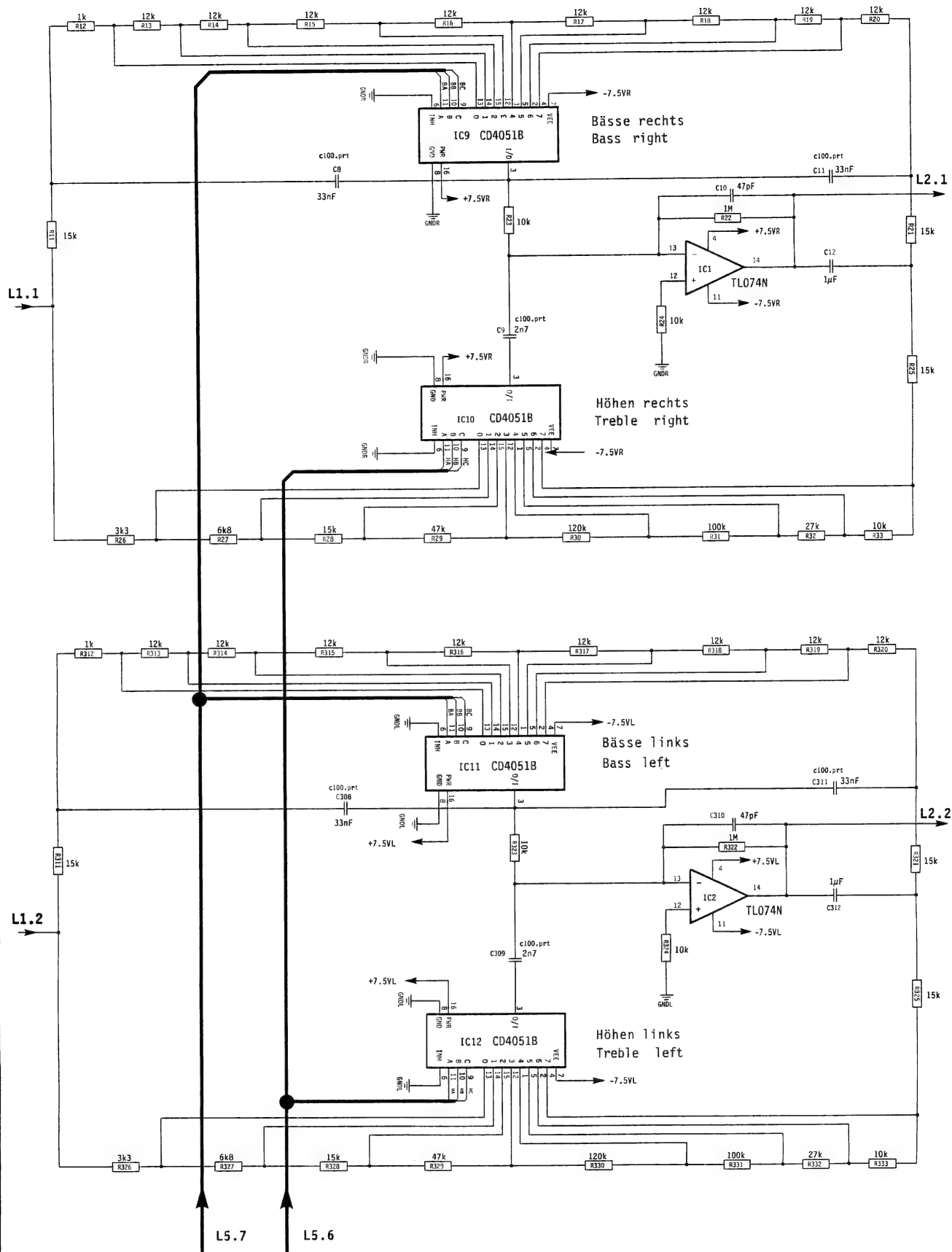


Bestückungsplan
Vorstufe Verstärker F91
Board layout
Pre-stage amplifier F91



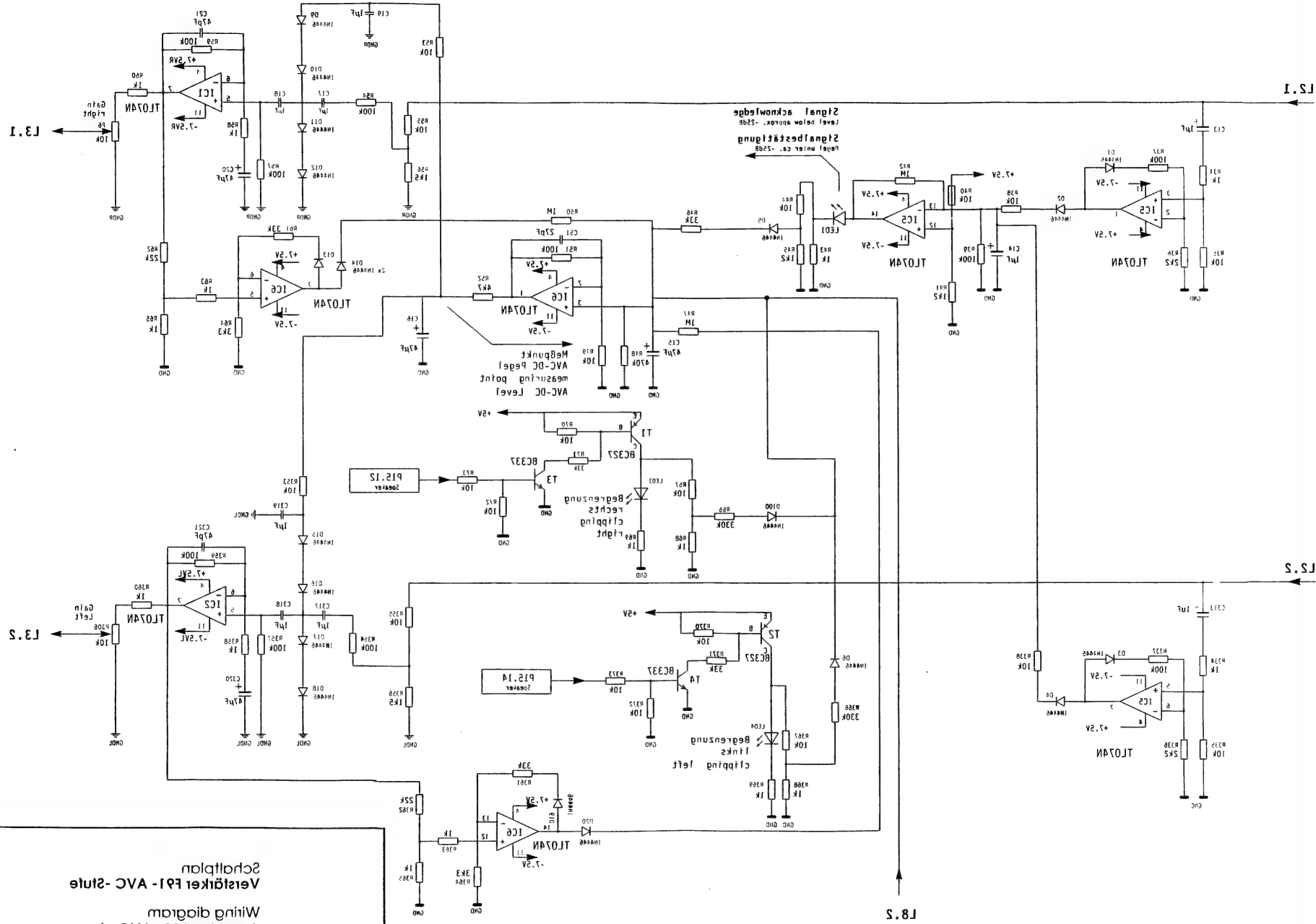


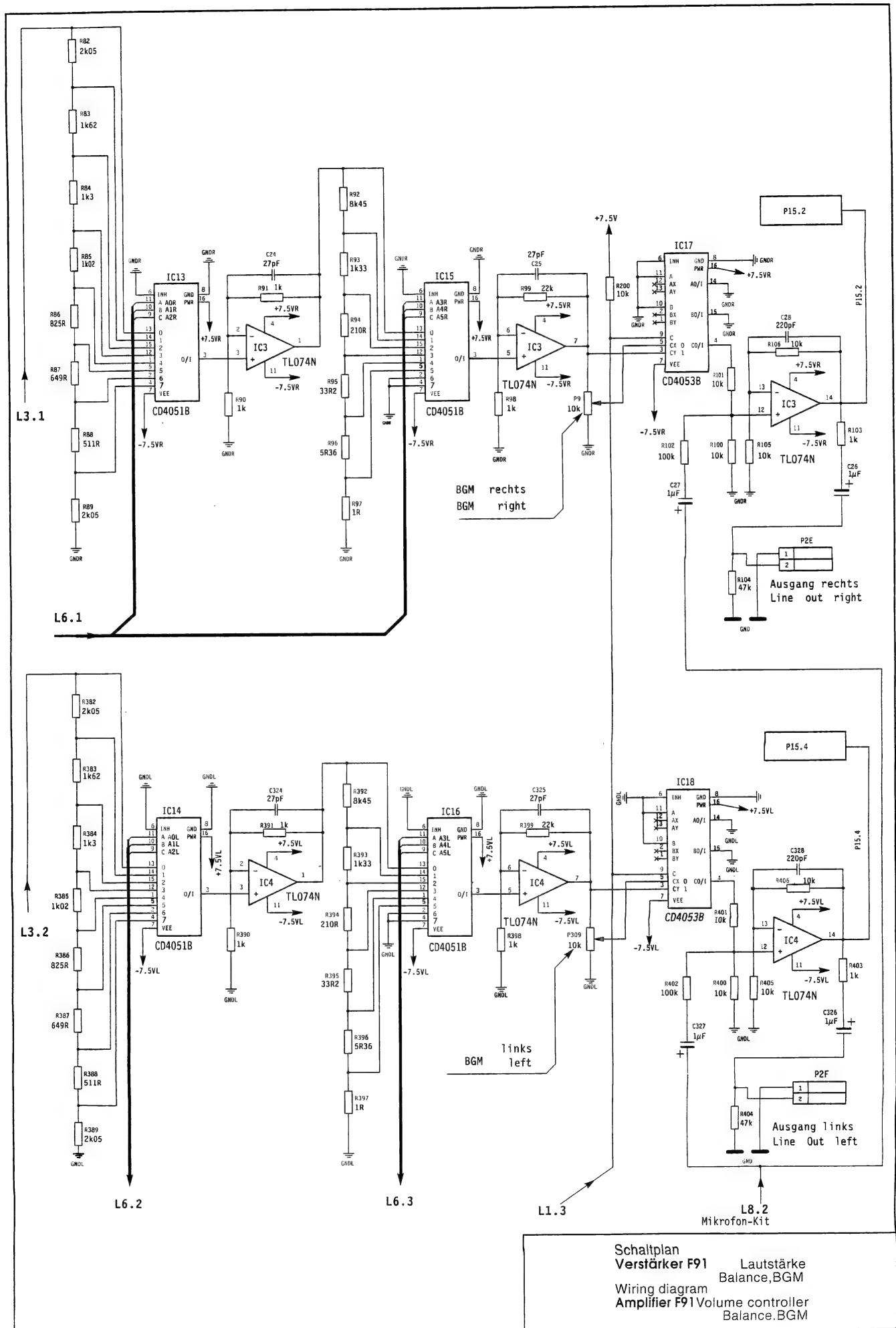
Schaltplan
Verstärker F91 - Vorverstärker
Wiring diagram
Amplifier F91 - Pre amplifier

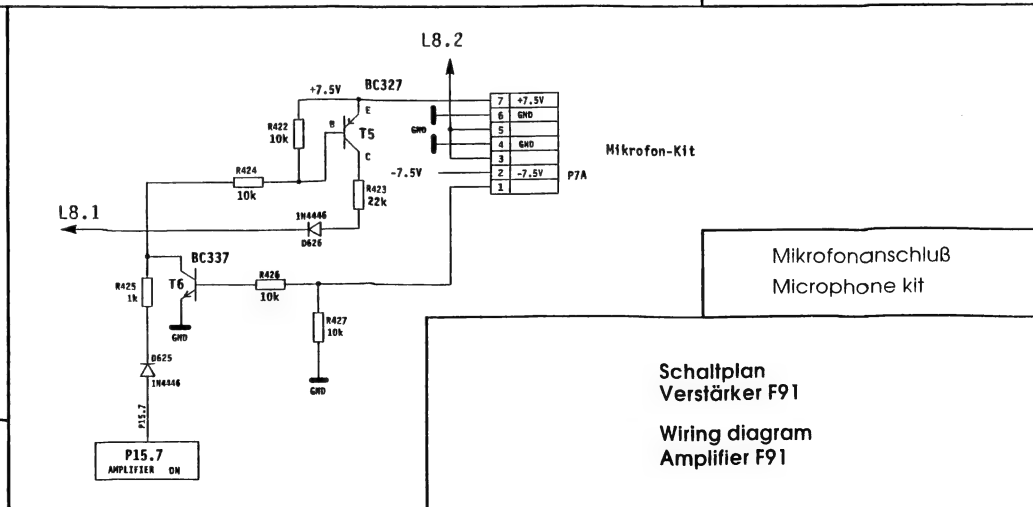
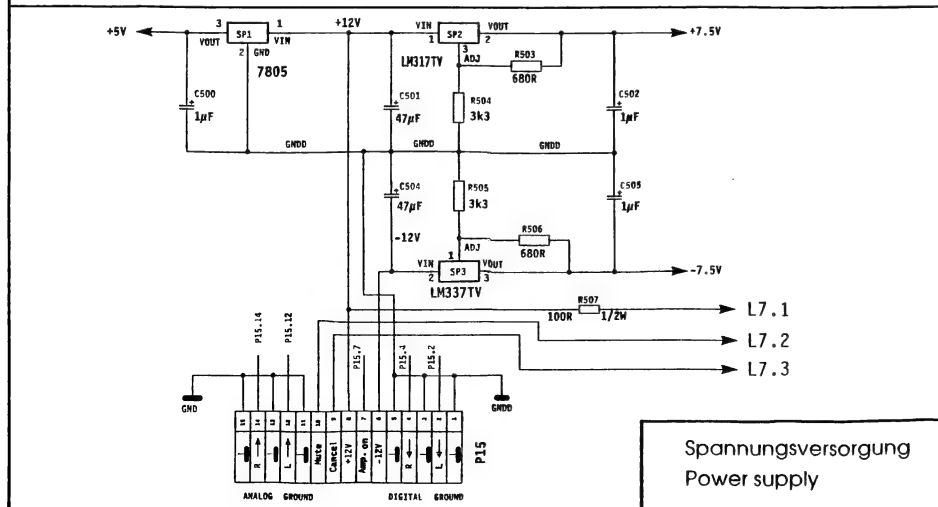
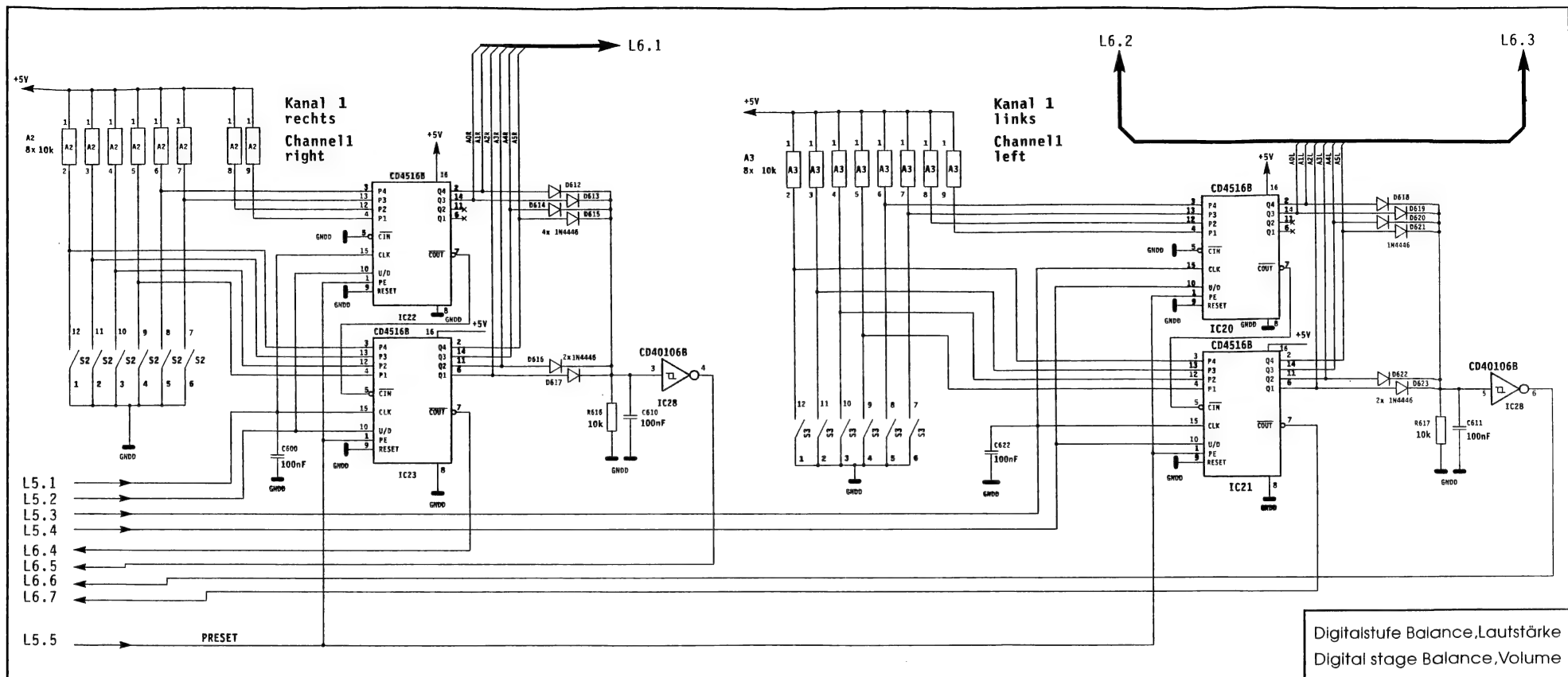


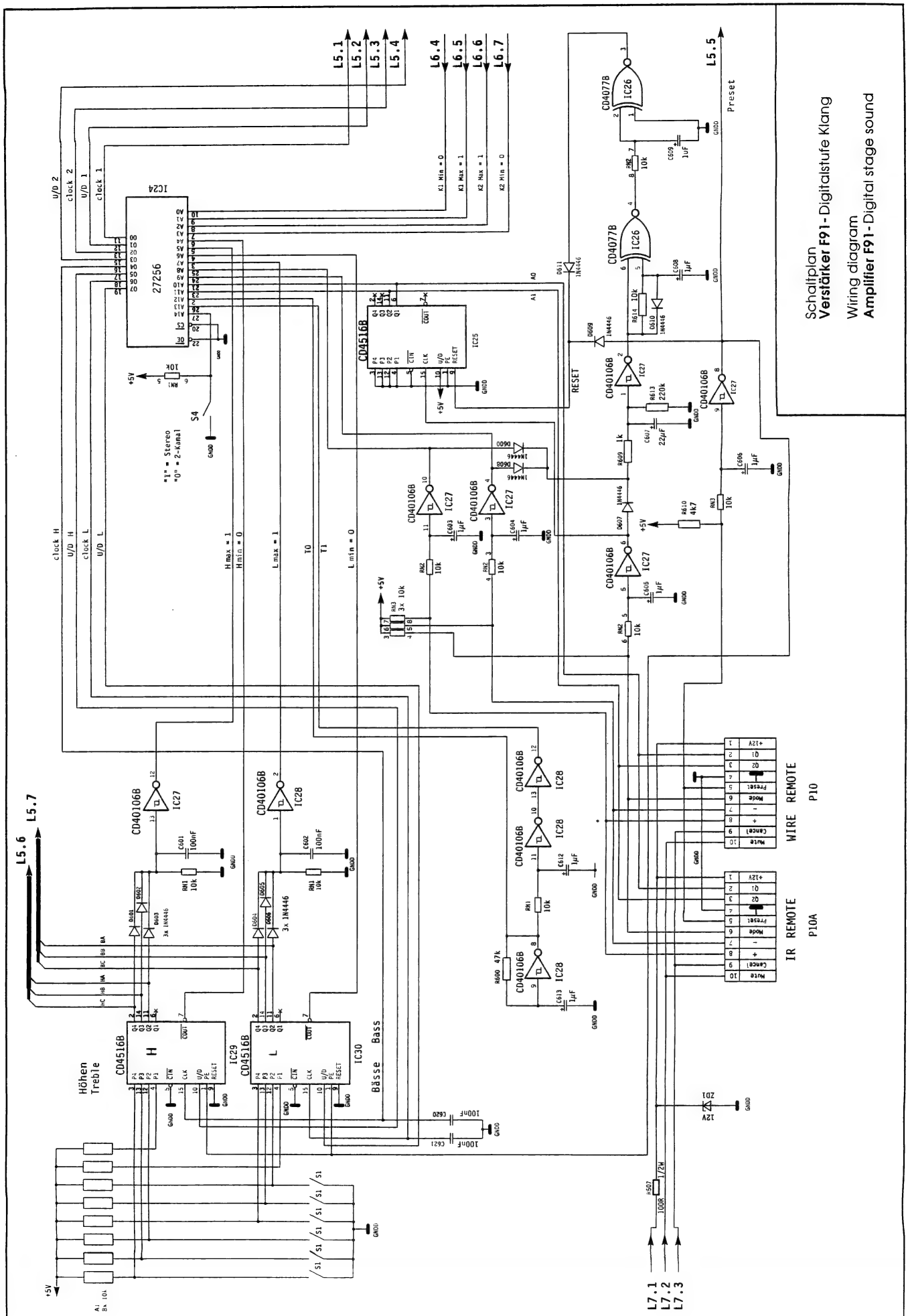
Schaltplan
Verstärker F91 Klangregelung
 Wiring diagram
Amplifier F91 Sound controller

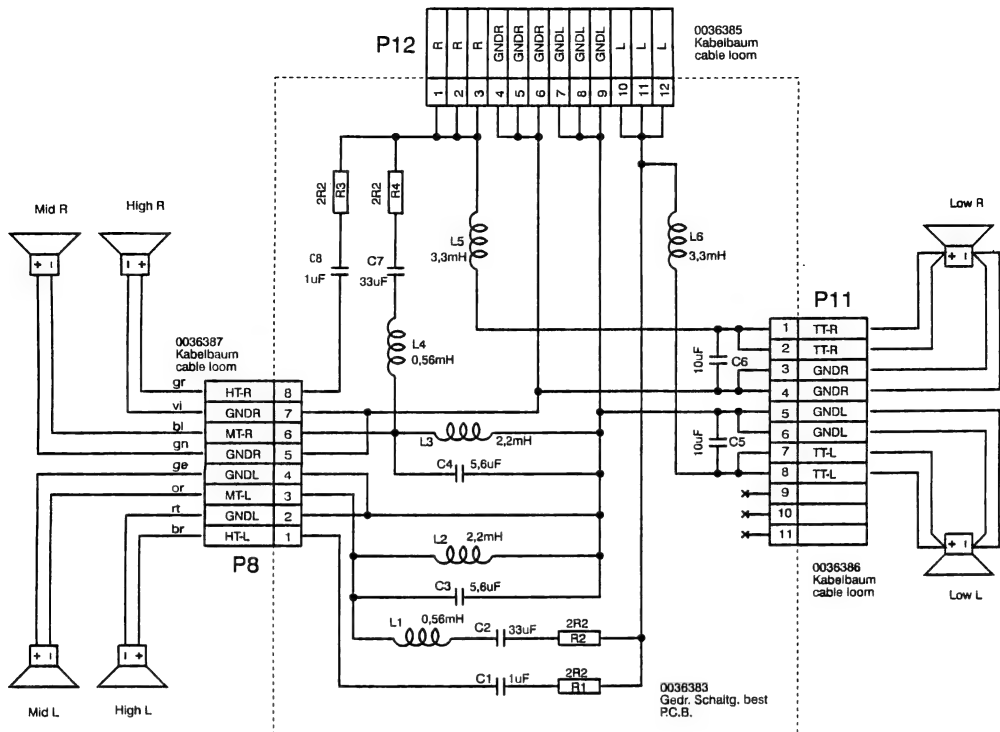
Amplifier F91 - AVC-stage
Wiring diagram
Verstärker F91 - AVC - Stufe
Schaltplan



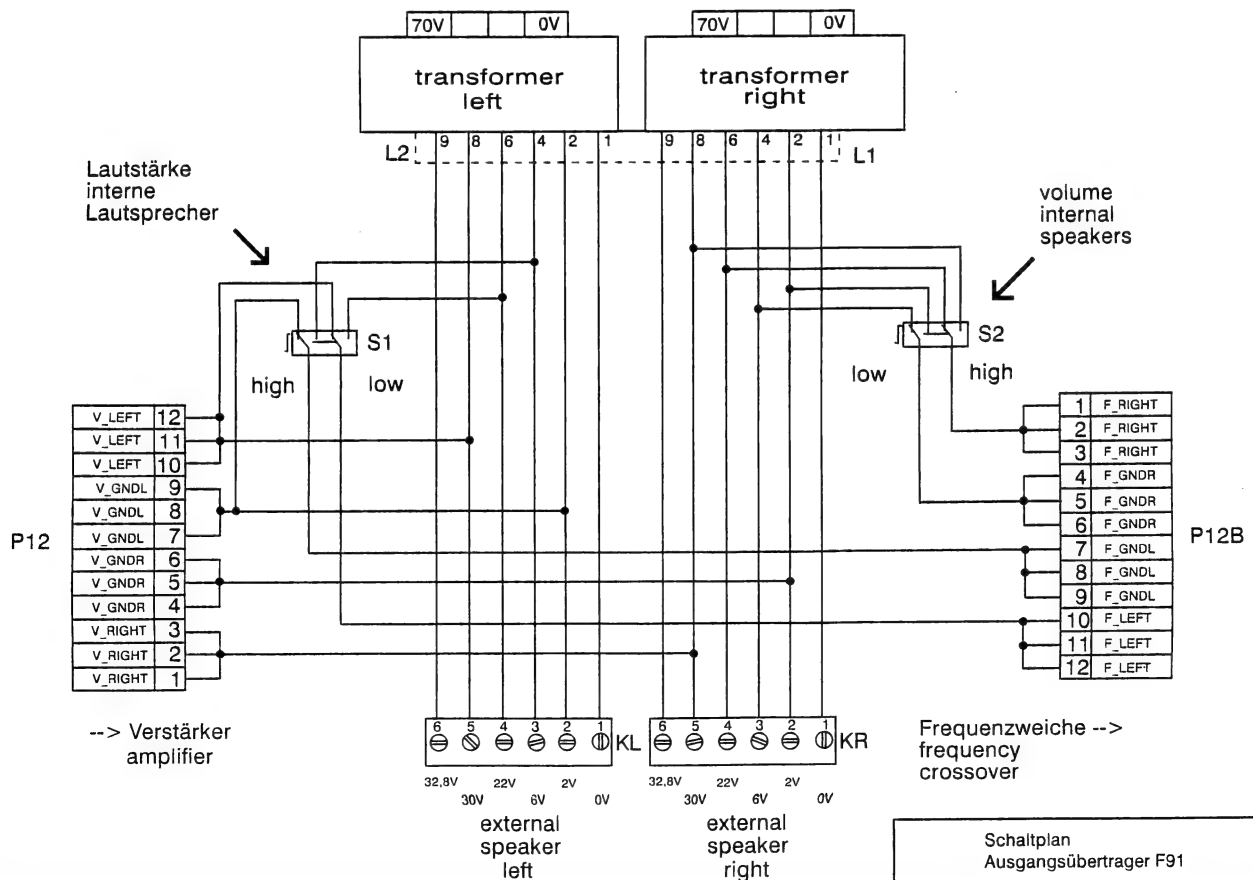


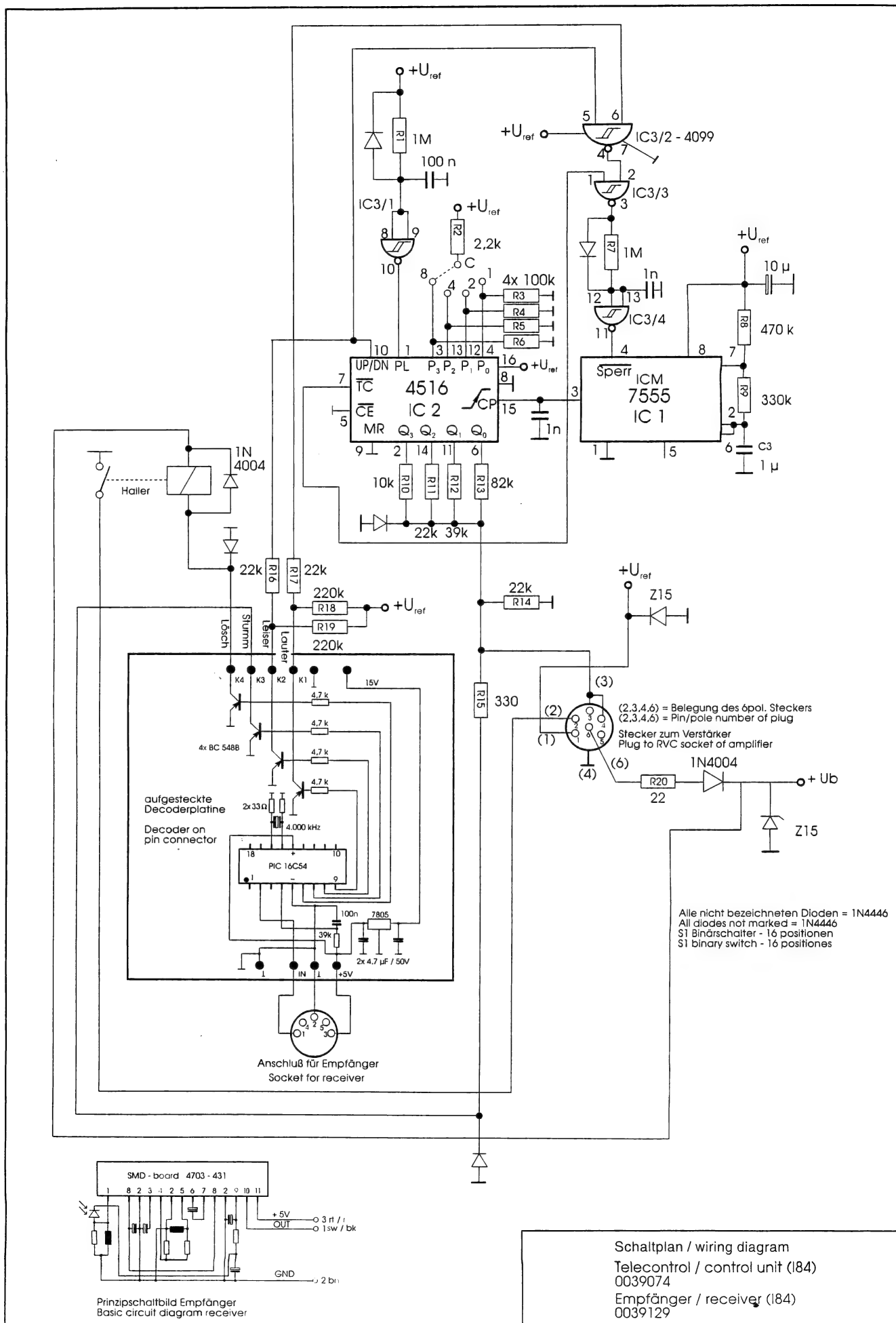


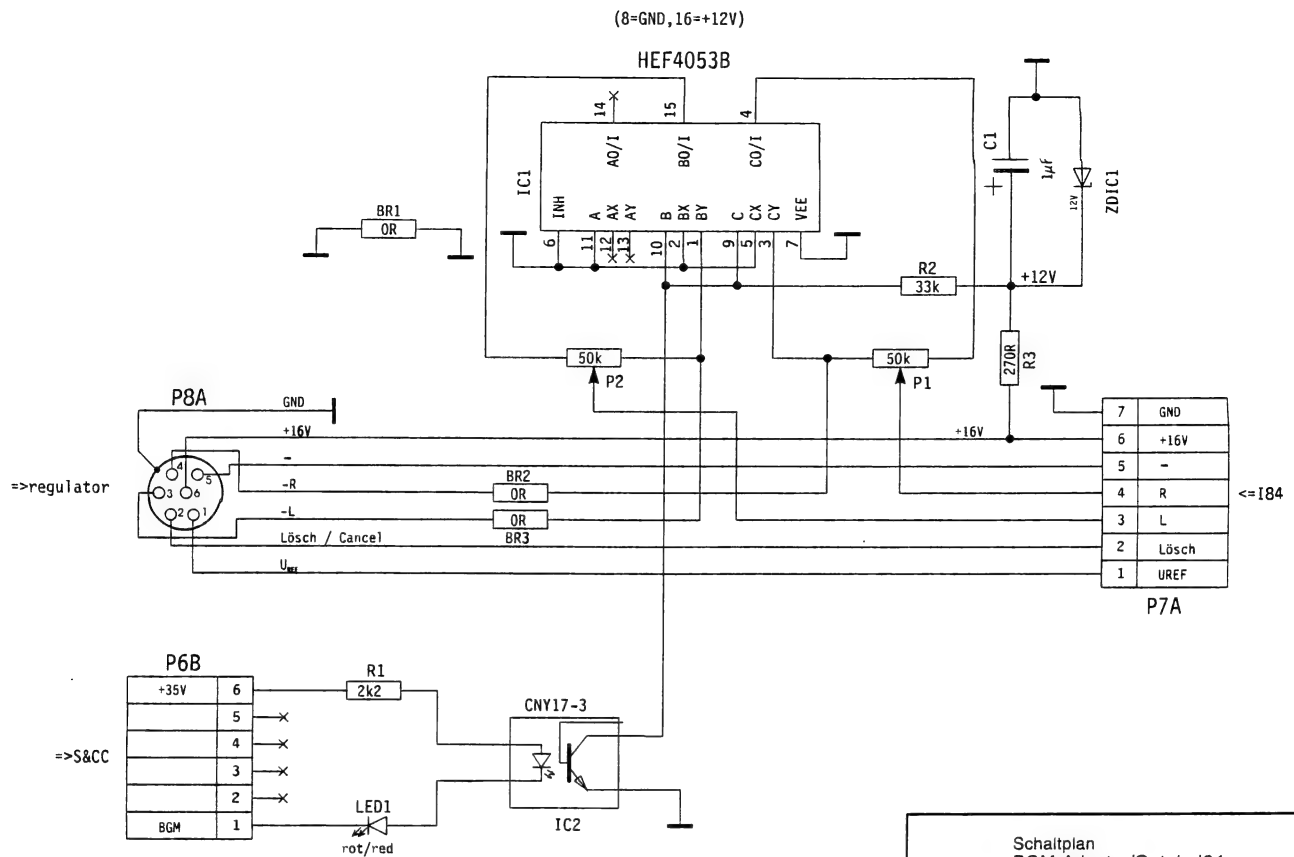




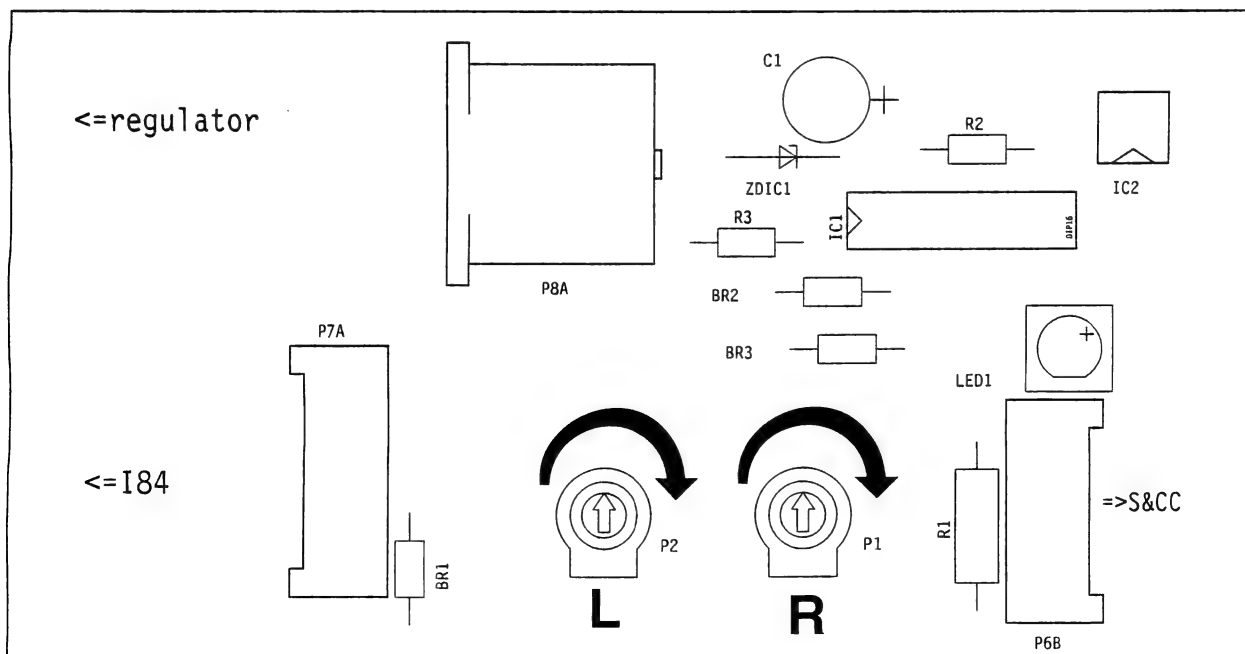
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Frequenzweiche für F91
Wiring diagram
Cross over network for F91







Schaltplan
BGM-Adapter/Optok. I84
Wiring diagram
BGM-Adapter/optoc. I84



Bestückungsplan
BGM-Adapter/Optok. I84
Board layout
BGM-Adapter/optoc. I84

15. Technical Data

15.1. Jukeboxes with amplifier I84

Power supply	110 - 240 Volts
Power consumption	in standby: 146 Watt maximum: 205 Watt
Dimensions	height: 146,5 cm width: 98,5 cm depth: 69,5 cm
Weight	188,0 kg
Power output	2x 60 Watts rms

15.2. Jukeboxes with amplifier F91

Power supply	110 - 240 Volts
Power consumption	in standby: 146 Watts maximum: 540 Watts
Dimensiones	height: 146,5 cm width: 98,5 cm depth: 69,5 cm
Weight	188,0 kg
Power output	2x 170 Watts rms

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